# THE IRON AGE

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# Rolling High-Speed Tool Steel Bars

Electrically Driven Mill of the Vanadium-Alloys Steel Company—Curves of the Power Requirements for Rolling Various Sections

The increasing application of electricity for rolling mill drives is again brought to the attention of the engineer through the recent installation of a 12-in. rolling mill, electrically driven, made by the Vanadium-Alloys Steel Company. This company manufactures high-speed steel for general machine tool purposes; taps, dies, reamers, milling-cutters, etc.; also a special grade of high-speed steel for hot die work. It also manufactures vanadium and other alloy steels and several grades of carbon steels. The works are located at Latrobe, Pa., near the main line of the Pennsylvania Railroad. The mill is being used for rolling high-speed tool steels almost exclusively.

ing intermittent and excessive loads is required, the bars being of the usual tool steel lengths, 12 to 16 ft. The load varies from zero to the maximum capacity every few seconds. As the rolls run constantly in one direction the conditions are simplified very much. Every precaution is taken to keep the mill tight, which results in a high friction load. This is found necessary due to the fact that a mill of this kind must be adjusted very closely. Orders are regularly filled for steel on which the tolerance is only 0.005 in.

Advantage was taken of the information gained in other installations, though these were usually in connection with the continuous or reversing type of mill. Electricity has,



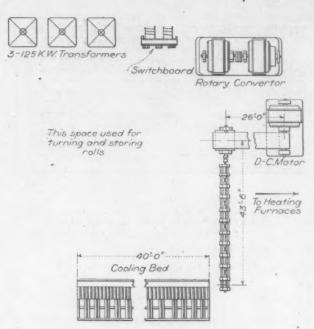
The Rolling Mill as Seen from the Entering Side

The employment of electric power to turn the auxiliary apparatus in iron and steel works has been in favor for a number of years. Its application to rolling mill drives is of comparatively recent date, however, and this seems to be the first case on record where it is to be used for driving a mill rolling high-speed tool steels only. The conditions imposed upon a mill of this kind are much more severe (due to the hardness of the product, the care necessary in working and the power momentarily required to roll the steel) than those imposed on the ordinary mill, rolling carbon or other alloy steels.

In rolling high-speed tool steel a drive capable of stand-

in this case, offered a flexible coupling between the prime mover and the rolls, and has reduced the cost of repairs and maintenance to a minimum.

One of the first questions that presented itself in connection with this drive was—"What kind of motor shall we use?" The relatively low continuous capacity of the direct-current motor, but its high intermittent capacity influenced the selection of the direct-current motor drive. The possibility of close speed regulations was also considered in connection with the direct-current motor. A three-knife, double-throw switch is used in conjunction with a rheostat to cut in or cut out resistance giving speeds



Plan of the Rolling Mill

of 60 to 200 r.p.m. of the motor. These changes can be made almost instantaneously, time being required only to overcome the inertia of the revolving parts.

The employment of electricity as a method of drive has made it easily possible, by means of the electrical instruments used, to measure the exact amount of power required for the different grades of material. The instruments show readily how the power varies as the temperature of the material varies and, also, allow for telling definitely what power each section requires. The instruments used are one ammeter, one volt-meter, one power-factor meter, one recording watt-meter; also, one large recording volt and ammeter, the latter used to check the system. The data obtained from these instruments also allow for figuring very closely on the cost of production of various sizes of bars.

The matter of proper drafts for the rolls which, in an ordinary steam driven mill has become a matter of long experience and trial, has adjusted itself beautifully in this mill, due to the data obtained from the recording instrument. It was formerly considered that the drafts on rolls to be used for rolling high-speed steel could only be about one-fourth to one-half the amount used when rolling the regular high-carbon steels. With instruments showing

the torque required, roughing rolls having drafts equal to those on any steam-driven mill operated for the same purpose, have been used, but with the strand rolls the drafts have been considerably increased over those regularly employed, while no danger of injuring the mill is encountered and an increased output is assured.

Observations indicate that the speed of this mill does not vary as much as 5 per cent., even with the high speeds. This is due to the overload capacity of the motor used, which is easily 100 per cent. This fact, too, also has enabled an increased output to be obtained while the high speed resulting is found to make a more uniform product, because when a bar leaves the mill the heat is evenly distributed throughout its entire length.

A large belt wheel used to connect the motor with the mill acts also as a flywheel, but is not necessary to equalize the variations in power required, as the variations in speed are so small that no time is lost in waiting for the flywheel to regain its speed between passes. The belt wheel used is 12 ft. in diameter, with a 42-in. face, and weighs 27,000 lbs.; the belt is 40 in. wide. This wheel is of special design and was made by the Dodge Mfg. Company, Mishawaka, Ind. As it was necessary to design a wheel that would withstand the strain produced when revolving at 200 r.p.m., care was taken in proportioning the members of this wheel to have balance in all parts when revolving at this high speed.

The wheel is cast in two parts, and eight separate tie rods fitted with turn-buckles are used to connect the rim with the hub where the parts come together. It has been found that little attention is necessary to keep the whole installation in perfect working condition; the attention of one man, only part of the time, has proved sufficient up to the present. This man starts and stops the system between turns, does all necessary cleaning and dusting, adjusts and keeps in proper condition all the brushes and attends to all switch-board repairs or alterations. Small push buttons are placed in several conspicuous places along the mill housing and near the pinions so that the power can be immediately thrown off by any employee on the rolls should it be required. Simplicity of general construction and reduced cost of installation, maintenance and operation are reported.

The accompanying sketch shows the general arrangement of this installation, including the mill housing and rolls, together with the special hot bed used. Power is furnished, to three 125-kw. transformers by the West Penn Electric Company. They transform the 60-cycle 6600-volt alternating current received to 400 volts. The power then passes to a Westinghouse 350-kw. rotary converter which delivers 600-volt direct current. The converter operates at 720 r.p.m., and is separately excited by a 60-cycle, three-



The Rolling Mill from the Finishing Side

phase Westinghouse exciter, running at 720 r.p.m. The power finally passes to a 350 kw. direct current, Westinghouse motor, which operates under a speed variation of 60 to 200 r.p.m. This is the motor that drives the rolls, it being connected to the flywheel by the 40-in. belt as before stated. The transformers are placed about 3 ft. apart to provide proper air space to help in cooling. They are placed in direct line with the switch-board and rotary converter, the direct current motor being placed a little to the The distance between the center of the direct-current motor and the mill is 26 ft., and the relation between the size of belt pulley and flywheel is three to one. relation provides for speed from 180 to 600 r.p.m. of the The whole arrangement is designed for compactness, neatness and low maintenance cost, but at the same time provision was made to take care of repairs quickly and cheaply.

The switch-board apparatus includes one combined oil switch and circuit breaker, connected to the 6600-volt al-ternating current side, to control the whole system. One three-knife switch is used to start the exciter; this is thrown out as soon as the rotary converter has reached its full load speed; two three-knife synchronizing switches are used to throw in circuit the direct current motor as soon as the direct current and alternating currents are synchronized as shown by two pilot lights. Two three-knife, double-throw switches are used together with a rheostat to cut in or out resistance to give speeds of 60 to 200 r.p.m. of the direct-current motor; one rheostat is used to regulate the rotary converter voltage. Five single-knife switches are used when starting the direct-current motor to bring the speed up slowly by cutting out resistance in the circuit. One direct-current circuit breaker is set to operate under a given time over-load. This circuit breaker acts before an excessive overload can be placed either on the motor, converter or transformers.

The diagrams show curves resulting from rolling the various sections of high-speed steels named. It will be seen that when finishing bars of  $2 \times 1$  in. from  $2\frac{1}{8}$  in. square billets the power required gradually increases from the first to the fourth passes. This increase is from 335 hp. for the first pass to 515 for the fourth pass. The power necessary in the fifth pass drops to 330 hp. and is fairly regular for the next two passes. The eighth and eleventh passes are known as "edging passes" and require only about 200 hp. The finishing pass, through the bull head rolls, it will be seen, requires from 200 to 225 hp.

The other curves when analyzed in the same way show very interesting results, and give in detail the exact power necessary to complete each operation. It will be noted from all of these curves that the friction load averages



Drive from Motor, Showing Also the Rotary Converter

about 48 kw. or about 65 hp. during the whole time that the mill is in operation.

The accompaning illustrations include views of the mill from different points. Attention is called to the compactness and accessibility of the component parts. The cooling bed consists of a cast-iron bed plate 40 ft. long, made in three parts. This plate is supported level by several concrete pillars and was planed on the top surface to make it true. A number of arms about 2 ft. long placed about 6 ins. apart extend from this plate at an angle of 30 deg. to a cooling bed made of steel rails. This bed is also held true by concrete foundations. This cooling arrangement was designed purposely for keeping bars straight when cooling from the high temperatures at which it is necessary to finish high-speed steel, and has given excellent results.

A partial summary of the advantages gained by the installation may be given as follows:

First cost of installation much below what a steam-driven mill would have been.

Necessary repairs can be made quickly and cheaply.

Labor in attention and maintenance has been reduced to a minimum.

minimum.

Less space is required because of the absence of boilers, pipes, etc.

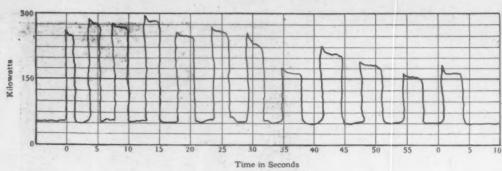
Close speed regulations which has increased the out-put materially.

Electrical instruments have allowed for the exact measurement of power used; also what power is required for various sections.

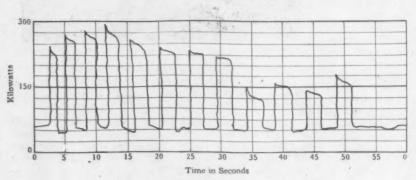
Electrical instruments showing the torque required have permitted the design of rolls having increased drafts. This fact alone has greatly increased the out-put.



End View of the Cooling Bed



Rolling 2 x 1-in. Bars from 23% in. sq. Billets-12 Passes



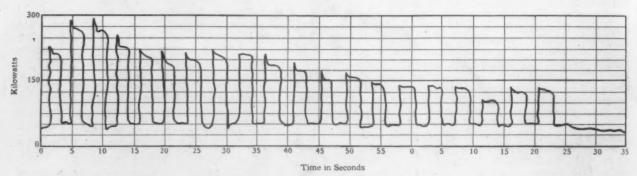
Rolling 11/2 x 3/4-in. Bars from 2 in. sq. Billets-12 Passes

The possibility of purchasing outside power at a nominal figure, together with the advantages numerated above has made the installation entirely satisfactory.

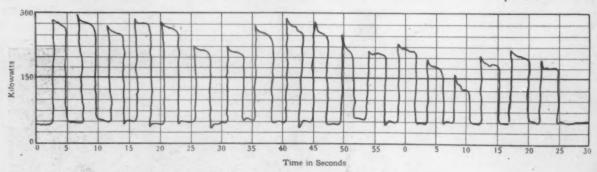
Much stress is laid on the advantages to be gained by the use of proper recording instruments, as the saving through a thorough knowledge of the amount of power actually

of power actually required to perform the necessary operations and the correct distribution of this power, will be a large factor in providing for the maintenance cost, and in meeting the expense of operation, trifling though this may be.

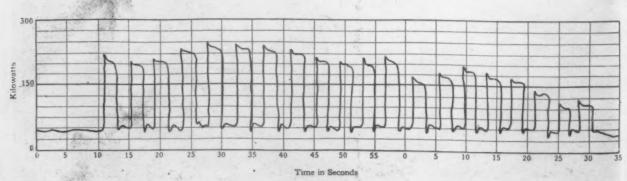
The Rockwell Furnace Company, 26 Cortlandt street, New York, is installing one of its large overfired accurate-temperature heat-treating furnaces for the New Process Steel Corporation, Lancaster, Pa. The furnace will be used for annealing steel wire, bars, etc.



Rolling 11/2 x 1/2-in. Bars from 2 in. sq. Billets-20 Passes



Rolling 1/2-in. Round Bars from 21/2 in. sq. Billets-18 Passes



Rolling 11/2 in. sq. Bars from 21/2 in. sq. Billets-20 Passes

# Blowing Tubs of American Design in European Service

Referring to the article on "Ore Transporting on Island of Elba," in the issue of June 20, it should be of interest to Americans to learn that the tubs or air cylinders used with the four Cockerill blowing engines are of the Southwark type. A photograph of one of these machines is here reproduced.

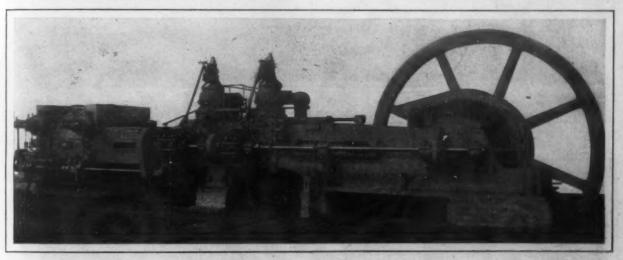
The three gas-driven blowing units are of the four-cycle double-acting type. The diameter of the gas cylinders in two of these is 1300 mm. (47.2 in.) and of the air cylinders 1500 mm. (59 in.), with a common stroke of 1400 mm. (55.1 in.). Each has a capacity of 13,000 cu. ft. per minute at 80 r.p.m. against a pressure of about 12 lb. The third unit is of the same construction, with the exception of the air cylinders, which are 2250 mm. (88.7 in.) in diameter, giving a capacity of free air per minute, at the same speed and pressure, of 28,000 cu. ft.

These engines are operated on gas from the blast furnaces, and they are supplemented by a fourth steam-driven unit of the same company's build, also having Southwark blowing tubs. This is a compound machine, with steam cylinder 900 and 1500 mm. (35.4 and 59 in.), air cylinders 2100 mm. (82.7 in.) and a stroke of .1500 mm. (59 in.). At 40 r.p.m. and 12 lb. pressure it has a delivery of 26,000 cu. ft. This unit is used in starting up when the furnaces are blown in, or when the gas from those in operation no more than suffices for the gas engines used in power

# Government Hearing on Flange Fittings

The Navy Department, Bureau of Yards and Docks, Washington, D. C., held a hearing June 17 to give manufacturers an opportunity to give reasons why they do not recommend the use of the 1912 U. S. specifications on Government work. The Government had representatives present from the following departments: Army, Navy, Auditing, Purchasing Department, Bureau of Yards and Docks, Bureau of Standards. The manufacturers represented were: Crane Company, Walworth Mfg. Company, McNab & Harlan, Best Mfg. Company, Kelly & Jones. The societies responsible for the 1912 U. S. standard were represented by Henry G. Stott, member of the Council of the American Society of Mechanical Engineers, and Henry B. Gombers, secretary of the National Association of Master Steam and Hot Water Fitters. Carl L. Carlson, Corps of Civil Engineers of the U. S. Navy, presided.

A. M. Hauser of the Crane Company, and Mr. Evans of Best Mfg. Company, put in their protest against the adoption by the Navy of the 1912 U. S. standard. Mr. Gombers outlined the efforts of the committees of the two societies for the past year and a half in conducting extraordinary correspondence with the principal companies manufacturing fittings in America to establish a standard which would best represent the interest of all, which resulted in the 1912 U. S. standard. Mr. Stott, who is superintendent of motive power of the Interborough Rapid Transit Company of New York, presented the desirability of adopting the new standard from the engineering point



One of the Gas-Driven Blowing Engines with Southwark Blowing Tubs at the Steel Works on the Island of Elba

service. Of the latter those supplied by the same builders, the Société Anonyme John Cockerill, Seraing, Belgium, are single-cylinder machines, three in number.

Since the blowing engines shown were supplied some minor modifications have been made in the Southwark gear. This unit, for example, has steam valves driven by a cam shaft, which also actuates the air valve gear; while the present practice of the Southwark Foundry & Machine Company is to have the air valve gear driven by means of eccentrics and rods. Recently built engines also have a larger area through the valves. The gear shown for the Elba engines, however, is substantially in accordance with the latest design and forms a good illustration of modern practice. That it should be adopted and extensively used in Europe, as well as in the United States and Canada, is gratifying to the American industry.

According to official figures furnished the Railway Department, the Canadian Northern Railway Company has under construction this year 1053 miles of new track. The amount of steel required for the new work this year is about 62,500 tons. The new equipment which will be installed this year is estimated to cost over \$8,000,000. It includes 136 locomotives, 4050 box cars, 1184 flat cars, 400 convertible construction cars, 70 cabooses, 6 snow plows, 1 rotary plow, 82 passenger cars, 35 mail and baggage cars, 3 dining cars, 4 parlor cars, and 16 sleeping cars. The Montreal terminals and tunnel are to be completed in 1914, and will involve the expenditure of approximately \$25,000,000.

of view. By making use of a set of temperature and expansion curves the principal points emphasized were that the factor of safety in the ordinary pipe line is from 16 to 20, while the factor of safety in the bolts is 2 or less, so that everything possible should be done to bring up the factor of safety in the bolts, flanges and fittings, especially in view of the enormous strains due to change in temperature. By comparing the 1912 U. S. standard with the proposed manufacturers' standard, the British and German standards, it was shown that the 1912 U. S. standard was the heaviest and strongest of all. Another important feature of the 1912 U. S. standard was shown to be the interchangeability of parts, where the proposed manufacturers' schedule has different face to face dimensions, and that the changes referred to extra heavy work and to sizes above 9 in. only.

The chief objection the manufacturers made was the enormous cost to them. It developed, however, from the testimony of one of the manufacturers present, that the cost of the change to the new standard would be practically very little, because they had already been through the experience once within the past two years, and this lack of expense was due to the fact that they did not use iron patterns or special tools in their work, but did all their facing on lathes and facing machines. During the remainder of the hearing the discussion settled down to what time would be necessary before everyone could be supplying material according to the 1912 U. S. standard and the general consensus of opinion seemed to be that within two years the new standard would probably become universal.

Mechanical and Civil Engineers,
PITTSBURGH, PA.

# The Broken Rail in a Great Northern Wreck

Report of James E. Howard to the Interstate Commerce Commission—Failure of the Rail Due to Laminated Seams and a Split Head

Publication has just been made of an Interstate Commerce Commission report on the accident on the Great Northern Railway, near Sharon, N. D., December 30, 1911, due to the derailment of the train known as the "Oregonian." The entire train left the track with the exception of the engine and tender. Two passengers and three employees were killed and 15 passengers injured. The accident was caused by a broken rail. It occurred at the beginning of a 2-deg. curve leading to the right on an ascending grade of ½ per cent. The track is laid with 85-lb. rails, 33 ft. in length, double spiked on both sides. Tamarack ties are used, with steel tie plates, there being about 20 ties under each rail, with 2 ft. of gravel ballast. The weather at the time of the accident was cold and stormy, with a temperature of 18 deg. below zero. In his report to the commission H. W. Belnap,

others with respect to the time of development. This initial fracture was followed by the fracture of the web and head between fragments Nos. 6 and 7 and fragment No. 9. Other lines of rupture followed in succession.

"Attention is called to that part of the report of Mr. Howard stating that it is characteristic of the crescent-shaped flange breaks, shown in Fig. 3, that there is practically no display of extension of the steel across the laminations. Rails display ample extension when the metal is strained in the direction of the length of the rail, parallel to the length of the lamination, but in a crosswise direction they show great brittleness. Wherever there is a lack of structural continuity in the steel, brittleness may prevail when it is overstrained at right angles to that lack of continuity. Stresses may more readily reach the necessary maximum in the base than in the head, probably

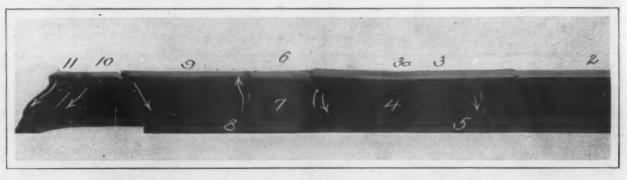


Fig. 1-Fragments of Broken Rail, Viewed from Gauge Side. Easterly portion of fragments

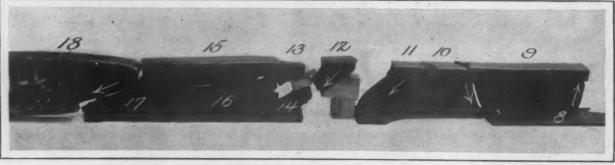


Fig. 2-Fragments of Broken Rail, Viewed from Gauge Side. Westerly portion of fragments

chief inspector of safety appliances, says that arrangements were made with the Bureau of Standards, Department of Commerce and Labor, to have the broken rail examined and the causes of its failure ascertained. This examination was conducted by James E. Howard, engineer-physicist of the Bureau of Standards. Inspector Belnap, in commenting on the results of Mr. Howard's examination, says in part:

Comments of the Chief Inspector of Safety Appliances

"Examination of the rail showed that although the head was split for a length of nearly 8 ft., the initial rupture at the time of derailment was the crescent base fracture between fragments Nos. 8 and 8a, as shown in Fig. 3. The rail was necessarily in a weakened condition by reason of the split head, but it had undoubtedly been in that condition, to some extent, for some time preceding the time of the derailment. The accident is believed to have been precipitated at this particular time by the development of the base fracture above mentioned. Between fragments 8 and 8a was found a longitudinal streak, or laminated seam, 6½ in, in length, with a depth of about 0.1 inch. This line of rupture appears to have preceded all

accounting for the fact that flange breaks are more numerous than split heads. The manner of accomplishing overstraining is quite different in the head than in the base, and from the examination of this rail it may be inferred that defects in the base are of a more grave character, relatively, and lead to more rail fractures than defects located in the head of the rail. The split head had been in this rail for some time and the rail had been passed over by many trains while in that condition, but the base fracture was probably fully developed by the derailed train. Laminated seams are regarded as a common cause for many of the base fractures and for many of the split heads.

"When subjected to the drop test the rail fractured on the first blow, but fulfilled current rail specifications in respect to elongation and interior soundness. Two other drop tests were also made, neither of which revealed any interior defects. The fragments tested were then subjected to crosswise bending, and it was found that laminated seams were present. The drop test, therefore, in this instance failed to detect these interior defects.

#### Laminated Seams the Primary Cause

"Mr. Howard further calls attention to the fact that the subject of laminated streaks is not a new one, that it has

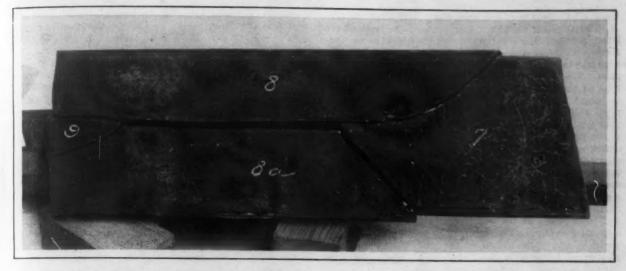


Fig. 3-Base Fracture of Rail Between Flanges 8 and 8a. Believed to have been the initial line of rupture at time of wreck

been dealt with in various congressional documents issued in 1908 and 1909, and that the presence of such streaks and seams in the finished rail can be attributed to the condition of the metal in the ingot.

"The examination of the broken rail causing this accident clearly shows that its failure was due primarily to the presence of laminated seams, thus weakening the base of the rail to such an extent that in all probability it was broken by the engine drawing train No. 3. These laminated seams are defects of manufacture, and current specifications, as well as tests made before acceptance, are not sufficient to insure the discovery of such defects. Careful track inspection should have disclosed the fact that this rail was defective, in so far as the split head or fissure was concerned, as the dark streak on the running surface of the head of the rail was very pronounced.

of the head of the rail was very pronounced.

"The number of rail failures which occur on the railroads of the United States is constantly increasing. On
the Great Northern Railway during the months of November and December, 1911, and January, 1912, there were
2760 rail failures. Of this number 936 were defective. One
interesting feature in this connection is the fact that of
these 936 defective rails 605 were 90-lb. rails made in the
years 1908, 1909, 1910, and 1911. Of approximately 600
rails which failed on the Minot division of this railroad
during 1910 and 1911, 80 per cent. were caused by fractures
starting from seams in the bases of the rails, while only 7
per cent. showed no signs of defects.

"Present specifications and tests, in so far as the detection of longitudinal seams is concerned, appear to be inadequate. In view of the fact that the existence of rails with defects of the character herein discussed has been recognized for several years, it would seem to be time that some definite action be taken toward eliminating this source of danger and securing structurally sound rails."

#### Report of James E. Howard

From the report of James E. Howard, engineer-physicist of the Bureau of Standards, we make the following

extracts which deal with Mr. Howard's examination of the broken rail:

"The rail which fractured was of Bessemer steel made by the Illinois Steel Company, weighing 85 lb. per yard, heat No. 66825, and branded '8509 Illinois Steel Co. South Works VIII-1906.' It was laid on tamarack ties, 20 to the rail, with tie plates, the rails being 33 ft. long. The order under which the rails were bought called for the following chemical composition:

	Per cent.
Carbon	0.48 to 0.50
Phosphorus	Not over 0.10
Silicon	Not over 0.20
Manganese	0.80 to 1.10

"The average composition of rails inspected on August 4, 1906, the month in which the rail was laid, was reported:

																								F	è	r	cei	nt.
Carbon		*	 		*		*	*		× .	 	 . *	*	*				*		 		×					0.5	3
Phosphorus																												86
Silicon						 					81				*				*				*				.0	88
Manganoon																											0	K .

"The dimensions of the rail were:

	In	ches
Height .		3
Width o	base	5
Thicknes	of web	11/16

"An intermediate part of the length of the rail was fractured at the time of the accident. The easterly end remained intact for a length of 18 ft. 7½ in., and the westerly end for a length of 8 ft. 11½ in., between which two parts a section 5 ft. 5 in. long was fractured. From the ruptured section there were 18 fragments recovered. These fragments and three short sections which were cut off by the railroad company were forwarded to the Interstate Commerce Commission, Washington, D. C., and by the commission sent to the Bureau of Standards. Subsequently the remaining parts of the rail were shipped to the Bureau of Standards, the entire rail then becoming available for examination and test.

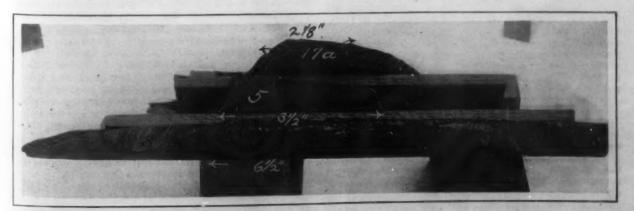


Fig. 4-Appearance of Fractured Surface of Flange 8, and Two Others. Each fractured surface displayed one or more laminated seams

#### Laminations and Streaks and a Split Head

"The examination of the fragments of the rail and the intact portions showed that it was defective in two respects: the steel was laminated and streaky in both the head and the base, while the rail also had developed a split head. The longest seamy lamination developed at the time of the fracture of the rail in the track was 61/2 in. in length, which occasioned a crescent-shaped base fracture, while the fissure of the split head was a little less than 8 ft. in length. It is believed that the initial rupture at the time of derailment was the crescent base fracture, notwithstanding the greater length of the fissure in the split head. The rail necessarily was in a weakened condition by reason of the presence of the split head, but it had undoubtedly been in that condition to some extent for a time preceding the accident. The wreck, however, is believed to have been precipitated at this particular time by the development of the base fracture along the line of a laminated seam, which initial fracture was immediately followed by a complete failure at the head, while other lines of rupture followed in rapid succession. The opening in the rail eventually reached a length of 5 ft. 5 in.

"A series of photographs was taken of the fragments of the rail, showing the lines of rupture, viewing the rail in elevation from the gauge side, from the top, and from the bottom in plan, and certain end views. The fragments

tures. In different parts of the length of the rail there were five such flange breaks, two being located in the intact ends of the rail on either side of the part destroyed at the time of the accident.

"It is characteristic of these crescent-shaped flange breaks that there is little or practically no display of extension, prior to rupture, of the steel across the laminations. Rails may and do display ample extension when the metal is strained in the direction of the length of the rail; that is, parallel to the lengths of the laminations, but in a crosswise direction they fracture with great brittleness, when, for example, the flanges are bent crosswise.

"So far as known, there is no material difference between the streaks and laminated seams of the head and those of the base, excluding those of the base which chance to have their origin in laps during rolling. Wherever there is a lack of structural continuity in the steel, brittleness may prevail when the steel is overstrained at right angles to that discontinuity. Overstraining more readily occurs in the base or in the flanges of the base than in the head of the rail; that is, the stresses may more readily reach the necessary maximum in the base. For this reason probably flange breaks are more numerous than split heads, and not from any substantial difference in the relative degree of lamination of the steel in those two parts of the rail. The manner of accomplishing overstrain-

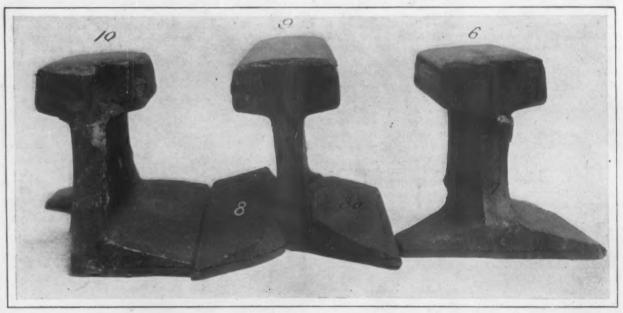


Fig. 5-End Views of Fragments Showing Size of Fissure of the Split Head

were so placed that the right sides of the photographic prints or groups represent the east ends of the fragments. Fig. I shows fragments Nos. 2 to II, inclusive, as they were marked for identification. No. I was a short piece cut off at St. Paul, into which the fissure of the split head extended, but which it was not necessary to represent in a photograph.

"Fig. 2 shows the balance of the fragments included within the 5 ft. 5 in. section. The direction of the movement of train No. 3 was from right to left over the rail, as photographed. The lines of rupture at the westerly end of piece No. 2 and the easterly end of piece No. 18 represent the limits between which the track fractures were developed. The fissure of the split head extended from a place near the easterly end of piece No. 1, along the length of the rail into fragment No. 11, an open fissure nearly 8 ft. long, while upon etching fragment No. 12 the split seemed to be present in that fragment, but could be traced no farther.

#### Crescent-Shaped Flange Breaks

"Fig. 3 shows the line of rupture between fragments 8 and 8a of the base, regarded as the initial line of rupture of the rail at the time of the wreck. Evidence concerning this feature of the case seems complete and consistent throughout. There were other secondary flange fractures, which also followed seams in the steel, the same as the initial line of rupture. Fig. 4 shows the appearance of the fractured surface of flange 8 and two other similar frac-

ing is quite different in the head from that in the base and it may be inferred from the example of this rail that, relatively, defects in the base are of a more grave character and lead to more rail fractures than defects which are in the head.

#### A Long Standing Split Head

"The fissure in the split head of the present rail reached a length of nearly 8 ft., and during the period of its development doubtless many trains passed over the rail, whereas the base fracture was of a less progressive character and not unlikely was wholly developed by the wrecked train. Laminated seams are regarded as a common cause for many of the base fractures and for many of the split heads.

"Fig. 5 shows end views of several fragments, illustrating the size attained by the fissure of the split head. Such a fissure could not reasonably have been formed by the passage of a few trains, but was one of progressive development and had been in existence for a considerable length of time. It is less disquieting than certain other fractures, any of which may lead to ultimate disaster, in that it admits of being discovered in the track in time to avert an accident; nevertheless it is undesirable, as are all defects which may cause injury and loss of life.

"There was no evidence of slag along the line of the fissure; that is, no more than that which may have been present in the laminated streaks. No slag pocket or inclusion of size was present.

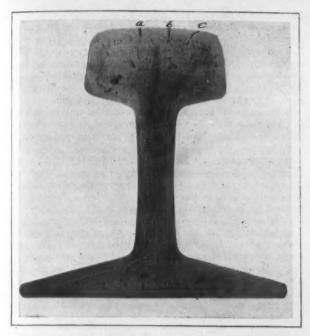


Fig. 6—Cross-section of Rail, Piece Marked No. 1, Beyond Limits of Split Head. Laminated seams at places marked a, b, c, d, e and f, revealed by bending a thin section of the rail

"If the fissure had its origin near the westerly end of the fragments, as seems likely, then it occurred in the immediate vicinity of metal high in carbon content, com-pared with other parts of the rail. Analysis showed the carbon to be 0.73 per cent. in the lower part of the center of the head, against 0.53 per cent. near the running surface. There was also segregation of phosphorus and sulphur in the vicinity. The segregated metal was found near the junction of the head with the web.

It does not follow that the proximate cause of the split head was segregation, but it may have been the combination of high carbon steel at the center of the head with laminated seams interposed between that and a medium carbon steel at the running surface. Such a combination seems adequate to induce the formation of a longitudinal fissure, which would constitute a split head when extended and developed. This suggests why the laminated state of the metal is regarded as a common cause for certain of the fissures of this type and for certain of the crescentshaped base fractures.

The combination is regarded as an unfavorable one, since a seam in hard steel is a greater menace than one in soft, ductile metal. And further, the soft surface metal of the rail, readily responding to the cold rolling action of the wheel pressures, introduces internal strains which, taken together with the direct wheel loads, may excessive lateral stress in the head of the rail. The great strength of the head against crosswise stresses generally prevents the formation of fissures which would occasion split heads; otherwise their more common occurrence would be expected.

#### Strains from Cold Rolling or Hammering

"It has been shown on earlier occasions that internal strains of great intensity may be introduced in steel by means of cold rolling or hammering. An experiment of this kind was repeated on the metal from the head of the present rail. Strains of tension were introduced by means of a small hand hammer reaching an intensity of 25,000 The surface metal, which was disturbed by per sq. in. the hammer blows, was put into a state of initial compression sufficient to strain the metal in other parts of the bar, in tension, in the amount above mentioned.

The cold flow of the metal at the running surface of a rail is witnessed in the fin which frequently forms on the outside of the head. Incipient longitudinal cracks have been found in the heads of rails, and those incipient cracks have been on the lines of streaks.

"Fig. 6 represents a polished and etched cross section of the rail just beyond the end of the fissure of the split head. A thin section was taken and ruptured in six places, four the head and two in the base, by transverse bending. Each fracture displayed a laminated seam, one of which

was attributed to the lateral cold flow of the surface metal of the head from the wheel pressures, the others to the initial structural condition of the steel.

#### Carbon Segregation

"Fig. 7 shows a cross section of the rail at the westerly end of piece No. 1, in which the fissure of the split head Carbon determinations were made from chips taken at the places indicated on the figure. It will be noted that the range in carbon was from 0.45 per cent. to 0.77 per cent., the lower carbon metal being found near the surface of the rail. surface of the rail. Subsequently other determinations were made, using chips taken nearer the top surface of the head, and the minimum carbon content there found

0.37 per cent.
"It is customary in current specifications to accept a chemical analysis from a test ingot as representative of the heat of steel, but unless the heat represents the rails there would seem to be no particular advantage in having the analysis. The carbon determination of 0.53 per cent. ported on August 4, 1906, was apparently considered as representing the metal in the rails delivered at that time, but it certainly did not apply to the cross section of this rail, which shows a range in carbon from 0.37 per cent. to 0.77 per cent. Questions of decarburization as well as of segregation are involved in a discussion of this aspect of the case, but results are quite meaningless which fail to indicate the composition of the rails, regardless of the composition of the test ingot. It seems inconsiderate to appear to seriously refer to the composition of the rail in which one part contains 100 per cent. more carbon than another

#### Brittle Fractures Along Lines of Seams

"Further considering the influence of lamellar streaks on the extension of the metal, specimens were prepared from both the base and the head of the rail, and bending tests were made with them, illustrating the brittleness of the metal when subjected to crosswise stresses. The results are of interest, since crosswise stresses are held to be directly accountable for the flange breaks in the bases of Tests should certainly be made in the rails in service. direction in which numerous fractures occur in order to demonstrate the useful properties of the rail in the track. Such tests should be made and not ignored, in any earnest effort to secure structurally sound rails.

"Fig. 8 illustrates the result of bending a piece of this rail

in a crosswise direction. [Other illustrations are given in the report, showing the breaking of the base into three strips by completing the fractures shown in Fig. 8.— Editor.] In preparing this specimen the base was planed off from the web side to a thickness of one-fourth of an

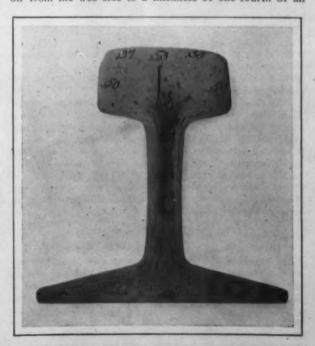


Fig. 7-Cross-section of Ra'l, Piece Marked No. 1, Showing Fi of the Split Head. Figures on illustration show percentage carbon found at different parts of the head, web and base

inch. It was then rough polished and etched, to show the location of the streaks, which appeared at the middle of the width of the piece. The specimen was then bent in a crosswise direction, starting two fractures, practically without the display of any extension of the metal, as shown.

"The fractures were completed, separating the base into three strips. Thus it was shown that the metal of the base was devoid of the ability to display permanent extension without fracture when bent in this direction, but the result merely conformed with experience in the track, where brittle base fractures of this class are of common occurrence.

"The middle strip of the fractured base was next bent in a lengthwise direction. It bent through an angle of 180 deg. without rupture. This bend was made in the direction in which rails are currently tested for acceptance. When the metal is bent in a lengthwise direction, or parallel to the direction of the longitudinal seams and laminations, the presence of such seaminess, which causes brittle crescent-shaped base fractures in the rails in the track, passes undetected. A similar test was made with a specimen from the head of the rail. This was planed down, from the under side, to a thickness of 36 in. It was bent in a crosswise direction, after having been polished and etched

cations in respect to elongation of the metal and interior soundness. In the two succeeding drop tests the elongation ranged from 3 per cent. to 5 per cent., the fractures as before revealing no interior defect. There was a fourth test made on the full section, a transverse test under static conditions in the testing machine. The distance between supports was 5 ft. This test permitted of the determination of the elastic limit of the rail, an important factor in the strength of materials, but not ascertained in the prescribed drop test. The elastic limit was 57,000 lb. per sq. in. The rail was bent through an angle of 30 deg. without rupture, the base elongating 15 per cent. and 16 per cent. respectively for 2 consecutive inches. The difference in the display of elongation in the two kinds of tests will be noted, as well as in the angle through which the rail was bent, which, in the drop test, was but a few degrees, against 30 in the testing machine.

"In order to determine whether the particular pieces of rail which fulfilled the requirements of the drop test in respect to extension and soundness were in reality free from laminated streaks and seaminess, two of the fractured ends were subjected to crosswise bending of the metal of the bases. The results showed the metal of these pieces seamy as other parts of the rail had been found.

"Prominence is given the subject of laminated streaks



Fig. 8—Base of Rail, from Piece Marked No. 1, Showing Brittle Fractures Developed Along Lines of Seams by Crosswise Bending

to locate the streaks. Fracture occurred along the line of a streak, in a brittle manner.

"Streaks and lamellar seams are known to be frequent occurrences and are recognized as detrimental to the integrity of the rails. It is important to review the question of their origin. It seems consonant with evidence acquired to attribute a considerable part of the responsibility for the presence of such streaks and seaminess in the finished rails to the condition of the metal in the ingot. A series of illustrations on this feature could be furnished, following the metal through the successive passes of the mill in the reduction of the ingot to the finished rail.

#### Drop Test Did Not Reveal Defects

"Drop tests were made upon three pieces of the rail. The details of the tests were conducted in conformity with current specifications; that is, the distance between supports was 3 ft., weight of tup 2000 lb., and hight of drop 17 ft. The first piece, tested with the head up, fractured on the first blow, displaying an elongation of 5 per cent. and 7 per cent. respectively for 2 consecutive inches, the fracture showing no interior defect; that is, the structural defects known to exist in the rail were not revealed by the drop test, the fracture being reported as having no interior defect. The rail thus fulfilled current specifi-

in this report since there can hardly be a reasonable doubt concerning the important part which they play in causing rail fractures in service. The gravity of the case requires emphatic mention of this feature. The subject is not a new one, but has in the past been placed before engineering and technical societies and associations having to do with specifications. From four to six years have elapsed since it has been recognized that laminated streaks were prevalent in steel rails and a prolific cause of fractures. Not less than 15 years have elapsed since the presence of streaks in steel forgings has been a source of anxiety.

#### Better Rail Steel Feasible

"It is important to consider whether an improvement in the structural condition of rail steel is attainable. Such seems to be the case, since experimental rollings have furnished rails which, so far as could be ascertained, were free from streaks. A critical examination and test failed to reveal any streaks or laminations in the bases of those rails. It is inferred from data at hand that the output of individual mills fluctuates, at times approaching nearer the desired state of excellence than at other times. It is believed to be metallurgically feasible to produce better rail steel than has at times been offered and accepted.

#### Conclusions

"In conclusion, it appears:

"That the immediate cause of the wreck of train No. 3 was a defective rail.

"That two defects were present in the rail, laminated

seams which weakened the base and a split head.

"That the proximate cause of the fracture of the rail was the weakness of the flanges of the base by reason of laminated and streaky metal.

"That laminated and streaky metal is present, without a reasonable doubt, in many rails now in service.

"That such metal has been the direct cause of the frac-

ture of many rails in the track for a term of years past.

"That it is metallurgically feasible to manufacture and furnish rails less defective than have found their way into the track.

That such defective rails are a menace to safe travel. "That specifications governing the acceptance of rails are inadequately drawn to exclude from acceptance defect-

That one of the most common types of rail fractures is not guarded against by current specifications, referring to the base fractures of the crescent-shaped type.

"That the defects in part have their origin in the metal

while in the state of the ingot.

That streaked and laminated metal in both the head and the base is probably a common cause for certain of the split heads and generally the cause for the flange breaks of the base, the magnitude of the wheel loads being understood as sufficient to apply the necessary overstrain-

That the chemical analysis of the usual test ingot does not furnish assurance of the chemical condition of the

finished rail.

That the presence of interior defects of a serious character, which have caused a great number of rail frac-

tures, is not revealed by the drop test.

It is believed that when seaminess and lamination of the metal shall have been eliminated, a very important advance will have been made in steel rail manufacture. Until that result is assured one of the vital features of the rail problem will remain unaccomplished. Assurance of the structural soundness of the ingot and subsequent shapes down to the finished rail will be furnished when a careful and critical examination of the metal at the different stages shall have been made. It is entirely inadequate for the purpose to make a cursory examination of the ingot. There is reason for believing that disasters of the kind caused by the breaking of the present rail will be of less frequent occurrence when structurally sound rails are partinto service."

#### Progress of Fuel Briquetting

Considerable progress has been made in the development of fuel briquetting in the United States in the last two years, according to Edward W. Parker, in a statement just made public by the United States Geological Survey. This country, however, still lags far behind some of the European countries, particularly Germany, in this line of industrial activity. In 1909 the production of fuel briquettes in the United States was 139,661 net tons, valued at \$652,697, an increase of nearly 55 per cent. in quantity over 1908. In 1911 the production amounted to 212,443 net tons, valued at \$769,721, the increase in two years amounting to 72,782 tons, or 52 per cent., in quantity, and to \$317,024, or 70 per cent., in value. In Germany the briquetting industry has made extraordinary progress, the production in 1910 being 16,668,605 net tons, and in 1911, 18,554.020 tons.

In Mr. Parker's opinion, more attention should be given to this industry, as on it depends to a considerable degree the utilization of some grades of fuel which are now wasted or sold at less than the actual cost of production. The reprehensible practice of shooting bituminous coal "off the solid"—a practice notably prevalent in the fields of non-coking coal in the Mississippi Valley—produces an inordinate proportion of slack, which might be made into

briquettes.

# Anthracite Conditions Favorable

Some probability of more substantial development of briquetting in the Eastern States is indicated by the recent advance of 25 cents a ton on the domestic sizes of anthracite, and the fact that there is little possibility of any future reduction in the prices of this fuel. In fact, further advances are more to be expected, in view of the rumored increase in royalty to be demanded by the owners

of coal lands in the anthracite region.

It seems reasonable, therefore, to suggest that the utilization of the small sizes by manufacturing them into briquettes, on which a profit could be made, might be more rational than selling these small sizes, as is now The available done, for less than the cost of production. quantity of raw material of this grade for briquetting is enormous. In 1911 the shipments of anthracite smaller than pea coal amounted to over 20,000,000 gross tons, of which 85 per cent. was obtained in the preparation of freshly mined coal. This 20,000,000 tons was worth not to exceed \$30,000,000, but if manufactured into briquettes egg and stove size at a cost of about \$25,000,000 it would have been worth \$70,000,000. In other words, the outlay of an estimated \$25,00,000, mostly in labor, would have brought a profit of 60 per cent. The enormous culm banks of the anthracite region, monuments of earlier mining methods, contain millions of tons of briquettable coal.

In 1909 the Geological Survey suggested that greater inducement to the investment of capital in briquetting could be offered if investors were assured of a regular supply of suitable binding material. The manufacture of co in by-product ovens, which yields coal-tar pitch that makes an excellent binder for briquettes, has shown notable progress in the last two or three years, and as the by-product oven is continuing to supplant the beehive oven at an increasing rate, the supply of coal-tar pitch at a reasonably low cost should be assured. In addition to the slack from bituminous, subbituminous, and semianthracite noncoking coal and small sizes of anthracite, three other kinds of raw material for briquetted fuel are available,

namely, lignite, peat, and coke dust.

The Los Angeles Gas & Electric Corporation, Los Angeles, Cal., operates a briquetting plant for utilizing the carbon obtained as a by-product in the manufacture of illuminating gas from crude petroleum, or "boulets," make excellent domestic fuel.

The briquetting industry, according to Mr. Parker, has been retarded by attempts to exploit secret binders and processes for which extraordinary and impossible merits are claimed. The pathway of briquetting development is strewn with wrecks that are due to this cause. There is no reason for secrecy in connection with the constituents of patented binders. The field is so large that there is room for everyone to develop the industry in paths laid out by the experience of European countries.

Twenty plants in the United States manufactured compressed fuel in 1911, an increase of 4 over 1909, but 4 of the 20 plants in 1911 were operated only in an experimental way or for demonstrating purposes. Of the commercial plants, 8 used anthracite as a raw material, 2 used bituminous coal, 2 used semanthracite, 1 used refuse from oil-gas works, I used peat, and 2 used mixed material. The manufacturers place their products on the market under special names, such as "boulets," "eggettes," "car-

bonets," "coalettes" and "patent fuel."

The Memphis Mining & Mfg. Company, Brown-Marx Building, Birmingham, Ala., is preparing to build a cold blast charcoal furnace near the town of Potts Camp, Miss., on the line of the St. Louis & San Francisco Railroad.
The furnace will be operated on spathic ore running over 60 per cent. in metallic iron after calcination, less than 0.05 per cent. phosphorus, an average of about 2 per cent. manganese, with no sulphur and no titanium. A. C. Jones is president of the company, W. S. Allen is vice-president, and Marion Allen is secretary and treasurer.

The Massillon Bridge & Structural Company, Maswith Tate-Jones & sillon, Ohio, has placed Pittsburgh, an order for the complete oil burning furnace equipment for its new plant. The placing of this order is the result of the satisfactory use of such furnaces by some of the officers of the Massillon company while connected with another bridge plant for which Tate-Jones & Co., Inc., installed furnaces several years ago.

# An Automatic Chain Welding Machine

A Self Contained Type Producing a Commercial Product from the Coil—A Lap Weld Evolved from Long Experimental Work

The Automatic Welding Machine Company, Bridgeport, Conn., has developed and is about to place on the market a line of automatic machinery for the manufacture of welded steel chain, rings and other forms where the wire must be endless and lies in one plane. The wire enters the machine from a coil and leaves it a marketable chain. The machine gives a lap weld, which the company's experience in developing the process has demon-

strated to be superior to the butt weld. The machine is designed to handle wire of all sizes, from small diameters up to 1 in. It will form chain of exceedingly short links, which may be desirable because of great flexibility. The only limitation is the diameter of the pin about which the end is formed and the room necessary to admit the adjacent link. The machine is essentially safe as concerns the electric current. The fundamental difference from the general practice is that the wire is thrown through the last link after that last link is completely formed except for the actual closing of the ends, instead of being threaded through as a blank before forming.

The chain machine of the sizes now ready for the market will complete from 10 to 25 links a minute of 3-16 in. to ½ in. straight link chain, according to the size, and from 15 to 25 links of German coil twisted chain of ½ to ¼ in. wire. The ring machine will produce rings of 1 in. to 2 in. diameter, of 3-16-in. to ½-in. wire at the rate of 10 20 a minute. The ring machine is practically the same mechanically as the chain machine the

mechanically as the chain machine, the only vital difference being that the ring or other shape is welded and given its final forming operation and is dropped out before the arrival of the next blank.

The effort of chain manufacturers and inventors to develop a machine which will automatically produce a welded chain from a coil of wire is an old one. A chain expert, in an article published in *The Iron Age* of January 5, 1905, gave it as his opinion "that there never can be

invented any machine that will form and weld a link of chain without the active aid and supervision of a skilled workman." The end was to be longed for, because of the cost of manufacture of welded chain by hand and because of the complications which attend the employment of this class of skilled labor.

Like most automatic machinery, the machines are designed each for its special purpose Each turns out chain

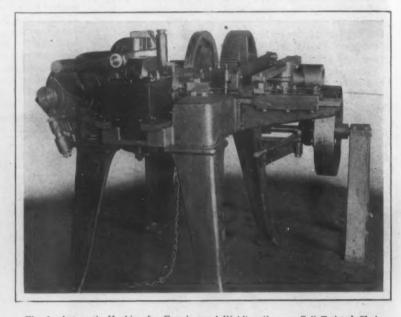


Fig. 2-Automatic Machine for Forming and Welding German Coil Twisted Chain

by the mile, but it is one kind and style and size of chain. Each change in the length or width or form of a link, or size of wire, even to a few thousandths of an inch, requires another machine. Consequently the manufacturer must have a full line of machines if he is to produce a full line of chain. The idea of the Automatic Welding Machine Company is that the manufacture of chain should be done by the makers of rods and wire, and sold by them

to chain manufacturers as their raw material, to be cut up and fitted with hooks, rings, swivels, etc. Their works would be assembling shops, according to this idea.

Referring to the machanical design of the machine, the operations are not unlike those of the commoner types of wire forming machines. Cams, each timed to perform its functions, constitute the essential factors. They control the slide motions and the opening and closing of the electric circuit which accomplishes the welding, applying heat at the instant the link is presented to the electrodes and shutting off the current when just the proper degree of temperature has been attained.

The wire is fed into the machine through straightening rolls and is cut off at an acute angle, the tool being cut under to give the pitch necessary for a lap weld. The main slide a, Fig. 5, then begins a continuous forward motion, which does not cease until the blank is in position to be delivered to the electrodes. The first effect is to form the welded end about the pins b, which are then withdrawn, the main slide advancing and forming the closed end about the

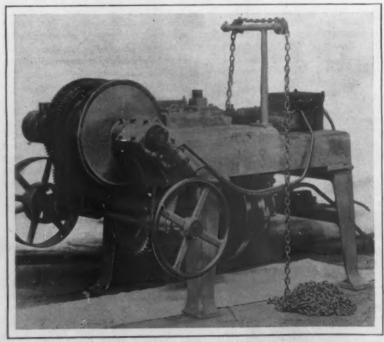
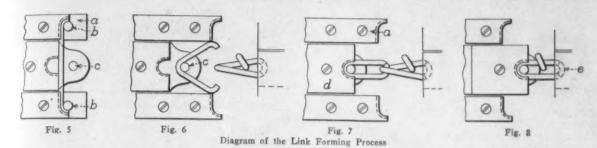


Fig. 1-Automatic Machine for Forming and Welding Straight Link Chain



pin c, Fig. 6. This bending process continues with the advance of the slide, and is concluded when the open ends are in position to pass through the last completed link, as seen in Fig. 7. The auxiliary slide d has advanced in the meanwhile, carrying with it the U tool, which completes

leased the link acts as a spring against the weld. When the link is subjected to the pressure of the forming tools after the weld is completed the outer surface has cooled somewhat, and this cooler metal is forced into the hotter interior mass, resulting in a tendency to cold-shut and thus

to weaken the weld.

Comparative cost of chain per 100 lb. made on machines of the Automatic Welding Ma-chine Company, and hand or fire-welded chain at union wages:

Size.	Stock.*	Weld- ing.	Over- head.†	Fuel	Depreci- ation.‡	Total.
18 38	\$1.30 1.50	\$3.75	\$1.875 .30	\$0.32 .25	\$0.13 .1665	\$7.375 2.5165
3/16	1.30	2.80	1.40	.33	.13	5.96 2.3755
- 54 54	1.30 1.50		.825 .20	.34	.13	4.245 2.2375
5/16	1.30 1.50	1.10	.55 .175	.35	.13	3.43 2.163
3/4 3/4	1.30	.83 .1625	.415 .1625	.36 .225	.13	3.035 2.1165
7/16 7/16	1.30 1.50	.71 .15	.355	.37	.13	2.865 2.07
3/4 3/4	1.30 1.50	.60	.30	.38	.13	2.71 2.0575

"Stock is rod for hand welding at \$1.30 and were for automatic welding at \$1.50. †Overhead is taken at 50 per cent of the labor or welding cost for hand welding and at 100 per cent. of the labor cost with automatic welding. ‡Depreciation is figured at 10 per cent for the machine welding and the corresponding figure for hand welding is waste amounting to 10 per cent.

Note: The fuel for hand welding is gas at 25 cents per 1000 cu. ft. and for machine welding is electricity at 2 cents per kilowatt-hour. With the lap weld the two ends, cut diagonally, are brought together slightly overlapping. The heat is created where they meet. The lateral squeezing of the wire at the joint by the electrodes and by the final forming tools brings the ends firmly together in the correct position. A slight fin or burr is formed which, it is found, is easily re-moved by tumbling. Even the fin could be removed in the

forming process, it is emphasized, but it is desirable to

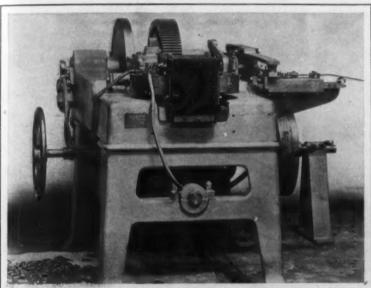


Fig. 3-Automatic Ring Welding Machine

the forming of the closed end of the link and also acts as a pair of tongs. When the pin c is withdrawn the link is held firmly by the U tool, the auxiliary slide advances and the link is delivered to the electrodes, as shown at e, Fig. 8. The welding completed, the link is withdrawn to forming tools, not shown, which perfect its shape while the welded joint is still hot.

The company went through a complete experience with butt welding before the lap welding machine was brought to the point of com-mercial success. Butt welding proved to have objectionable features which were impossible to overcome. A pronounced burr, which amounts to a ridge of considerable relative hight completely encircling the wire, is an inevitable result of welding by this method and cannot be removed. This peculiarity is wholly undesirable, because of the appearance of the chain and because usefulness is restricted.

The reason for the burr is one which cannot be removed by practicable methods it is believed. It is wholly mechanical In fire welding the metal heats from the exterior inwards. In electric welding it heats from the center of the wire outwards. When the spark starts, that is to say, when the surface has became highly heated and the more volatile elements of the steel, notably the silicon, sulphur and phosphorus, begin to free themselves from the mass in the form of sparks, the welding process begins. In butt welding pressure along the lateral axis of the link is induced by forming tools and the ends are brought together under tension, an undesirable condition, because when re-

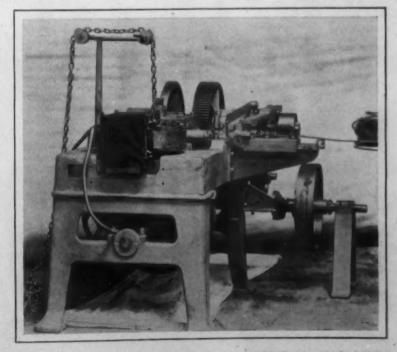


Fig. 4-Rear View of Machine in Fig. 1 for Forming and Welding Straight Link Chain

keep these slivers of metal attached to the link until it has left the machine. The accompanying table has been prepared by the company to show the difference between the cost of manufacture by the new machines and by the hand process.

# Accidents in a Machine Tool Works

# An Analysis of Seven Years' Statistics of the Plant of the Brown & Sharpe Mfg. Company\*

BY LUTHER D. BURLINGAME

In making a study of safety methods and safety devices, an analysis of the accidents that have occurred in one of our large machine shops may be of service for still further protecting the workmen when engaged in their various lines of employment.

A careful record of all accidents in the works of the Brown & Sharpe Mfg. Company has been kept during the last seven years and a study made of them for the purpose of ascertaining where danger is greatest, what accidents are preventable and how best to avoid them. It may be said that in this factory extra care has been taken for many years to guard against accident and the management has never hesitated to spend money for that purpose when convinced that it would bring about safer conditions. During the last year an additional effort has been made to profit by past experience both at our own works and by the experience of others and still further to tune up the safety equipment and spirit of the organization in order that accidents might be reduced to a minimum.

When this additional work was undertaken, about a year ago, an analysis of all accidents which occurred during the previous six years was made along three lines: (a) the percentage of accidents under each of 18 headings from different causes; (b) the percentage by departments of the shop, divided into more than 30 groups; (c) the seriousness of the injury and the resulting length of disability from work. Following this, a similar record is being kept each year showing (d) waat kinds of accidents are increasing and what kinds are being decreased by the further safety methods being adopted, also which departments are reducing their accidents and which are growing worse.

The different kinds of accidents were classified as follows, and the percentages given are for the six years preceding the date of the investigation, i.e., 1905 to 1910 inclusive

clusive.	
Classification of Accidents.	77
Total Accidents.	Per- centage.
	centage.
Caught in machinery 78	7
Caught or struck by belt	2
Set screw or other projection	2.6
Falling on or striking workman 226	20.1
Workman falling or strain lifting 75	6.7
Machinery starting unexpectedly 8	0.7
Chain or rope slipping or breaking 10	1.0
Punch press, rolls, or shears	2
Cutters and metal saws 94	8.5
Handling work or chips-eyes	11.2
Woodworking machinery 47	4.2
Burns, including electricity 79	7.0
Cuts with sharp instruments 20	2
Jams and hammer blows 71	6.3
Caught in tool and work (not cutters) 176	15.7
Elevator 4	0.5
	1.2
Litter or dark places	. 1.3

#### The Showing of Guarded Machine Parts

These accidents naturally divide into two groups: (1) those caused by machinery either (a) by being caught in the gearing, belting or other parts of the machinery, or (b) by being injured by the cutter or other tool or caught between the tool and the work; (2) those caused by falling, jams, burns, cuts, etc. The first group includes 42.7 per cent. of the accidents occurring during the six years, divided as follows: group (a) 12.3 per cent.; group (b) 30.4 per cent. This leaves 57.3 per cent as the proportion of accidents occurring under the second group.

From the above analysis it will be seen that if complete guards could be provided so that every accident due to being caught in gearing, on set screws, or anywhere in the mechanism of machinery would be avoided, it could at

most only reduce the accidents 12.3 per cent. Several recent occurrences show the unexpected accidents which result from this cause. A workman, hearing a rattling in the knee of a milling machine he was running, reached his hand underneath to see if the cause were due to a collar which he thought might have become loose, and stuck his finger into the running gearing.

Another case was that of a workman who reached for a can of oil which he had left on a ledge of the machine. In lifting it up he caught a finger in the pump gears back of the guard. Both of these accidents occurred on machines considered sufficiently guarded, and to experienced workmen, indicate that to have complete safety it may be necessary to inclose all gearing entirely, whether or not it is exposed.

A way of preventing accidents by being caught by set screws or other projections, also coming under this division, is to insist on the wearing of short-sleeved jumpers, to avoid loose clothing, hanging neckties, etc. One of the apprentices at the Brown & Sharpe Mfg. Company's works was injured recently by having the pocket of his jumper catch on the set screw of the revolving dog while he was filing. All of the boys running machines at this plant are obliged to wear short-sleeved jumpers and the men are advised to. Seventeen of the accidents reported were due to being caught by the sleeve of the jumpers.

The company is now experimenting with various forms of safety dogs, none with the projecting set screws having been added to the equipment during the last year. The plan of changing the regular dogs for headless screws adjusted with a socket wrench is also being tried experimentally.

### The Idea of Protection at the Cutting Point

The accidents in group (b) are more frequent and more difficult to guard against. It is practically impossible in many cases to do guarding at the point of cutting, and if guarding is attempted it may introduce dangers greater than those sought to be avoided. It is, however, possible to insist that the fingers shall never be used to wipe off chips, etc., from a running cutter. Out of the 94 accidents from cutters reported, 30 were caused by being caught when wiping off chips with the fingers.

In the use of punch presses 20 accidents had occurred in the period investigated, so this was one of the first matters to be considered. The means adopted for guarding against these accidents were novel, as far as the author is aware, and have proved fully successful both in avoiding accidents and in preventing an appreciable increase in cost of doing the work. A rule was made that the fingers and hands must never be put between the punch and die. Tweezers and pliers were furnished for handling the work, the points being shaped in some cases to suit particular jobs. The only accidents since have been to the points of the tweezers and pliers. Chutes have also been used to slide the work into position, a stick being used to remove it after the operation. For some work which it was thought could not be handled by the above means, a swinging fixture was designed so that the work can be put in place away from under the punch and then swung into position for the operation.

The 47 accidents from woodworking machinery were largely cuts from circular saws, but included eight where the block of wood was thrown back when slitting, two of the cases being fatal, the only fatal accidents in the works during this period. The men are now required to wear heavily padded aprons when using a slitting saw, and this has, it is believed, saved the lives of several workmen. The use of a "spreader" when properly installed helps to prevent such accidents by keeping the cut from closing in back of the saw.

Another prolific source of accidents which, while not serious perhaps, are painful, is in being cut by revolving grinding wheels, especially when doing internal grinding and trying the plug in the hole without running the wheel back a sufficient distance. Twenty-eight of the accidents were from this cause. A shield has been designed which automatically swings up in front of the wheel so as to protect the hand if the plug should slip.

### Accidents Within Control of the Workman

Under the second group, falling, jams, burns, cuts, etc., a large proportion of the accidents are entirely within the control of the workman, either the one hurt or a fellow

<sup>\*</sup>Paper presented before the April meeting of the Providence Association of Mechanical Engineers (affiliated with The American Society of Mechanical Engineers).

workman, and the remedy is largely to be found by employing careful methods. In this, however, the foreman can exercise a large influence for safety. Some specific remedies can also be applied. It was found that 37 cases of burned feet in the foundry had resulted from wearing laced or low shoes. A rule was made that Congress or other high shoes without lacing should be worn, and a supply of such shoes is kept and sold to the foundrymen at about cost. This has nearly remedied the trouble. There remains, however, the liability of the iron spattering into the tops of the shoes and burning the legs when the pants are ragged. A study is being made of the possibility of using pants made of non-burnable material.

About one-fourth of all the accidents are caused by weights falling on the workman and jamming or cutting either the hands or the feet, and from the workman himself slipping and falling. The remedy here is to use care that safe methods are employed and that men do not take chances. Classified with these are 13 accidents traceable to "fooling," some occurring outside of working hours.

#### Departments Having Most Accidents

In considering the classification by departments and kinds of work, it was found that, for the period of six years, the average number of accidents was greatest in the following departments, the percentage of employees injured each year being as follows:

Grinding department, 13.8 per cent., being caused largely by cuts from grinding wheels. This has been much reduced during the past year, so that this department now ranks eighth instead of first in order of accidents.

Laborers, 10.6 per cent., largely from injury by falling objects, jams, strains in lifting and the workman falling.

Carpenters, 10 per cent., a large proportion of the injuries being due to woodworking machinery.

Foundry, 9.5 per cent., due mainly to burns, also to falls and falling objects.

Then follow the various machine departments from 7.6 per cent. down to 2.2 per cent., and ending with the inspection department, the offices and the drafting department with the percentage coming down to 0. Only four elevator accidents, and these slight, occurred during the six years, a very good showing with more than a dozen elevators in constant operation.

#### Statistics of Seriousness of Injury

In the classification by seriousness of injury and length of disability of 1124 accidents occurring during the period of six years covered, 382 resulted in no disability, that is, no absence from work. In 457 cases there was less than one week's absence from work. Of the remaining 285 cases, 132 resulted in between one and two weeks' absence; 74 in two to four weeks; 51 in one to three months' absence; five in three to six months' absence; and five in over six months' absence. In addition, eight were hurt so as to cause the loss of an eye, a foot, or permanent injury, two dying from the effects of their injuries. Ten men left, and no record was kept of the duration of their disability. These statistics form a good basis for future investigations looking toward a still further accident reduction.

In 1911, with an average of 4050 employees, there were 243 accidents, or about 6 per cent. of the workmen were hurt sufficiently to report; this on a basis of reporting slight accidents as well as those of a more serious character. Some of the added measures for safety had been in operation during part of the year, so that the gain from 6½ per cent., the record of the previous year, to 6 per cent. for 1911, indicated a gain due to such further safeguarding. This gain was also shown in the reduced number of serious accidents included in last year's list. There were no fatal accidents; no loss of eye or limb, and more than 70 per cent. of the reported accidents resulted either in no disability or in less than one week's loss of time.

In some few departments, where accidents increased during the past year, special steps are being taken to ascertain the cause and to avoid a repetition. Each accident is studied to learn the lesson it teaches as to further methods of safety. It is hoped by such means to reduce the accident list to a minimum for the benefit of both workmen and employers.

# A New Device for Reversing Motor Boats

A motor boat engine attachment in the way of a switch to reverse the engine at will without fear of stopping or damaging the engine, has been developed by J. B. Moore, Washington, D. C. This switch in itself consists of two separate parts, the combined weight of which is less than I lb. One part, the tripping roller, is attached to the rim of the flywheel on the side next ot the engine cylinder. The other part, the switch proper, is attached to the engine bed.

The ground or engine ignition wire instead of being attached to the engine is attached to the switch so when



Moore Reversing Device for Motor Boat Engine

the chain is pulled the ignition circuit is broken, which causes the engine to slow down. The tripping roller, while the flywheel is rapidly revolving, is held out through the action of centrifugal force, toward the rim of the flywheel, but, as the speed diminishes, the counteracting spring pulls the roller in toward the crank shaft. When the engine slows down to just the proper speed the roller throws the switch and the advanced explosion thereby effected in the engine cylinder brings about a reversal of the engine. The device has three moving parts, none of which are in use except when it is desired to reverse, slow down or stop the engine.

The Western Conduit Company of Ohio, a subsidiary of of the Youngstown Sheet & Tube Company, has been organized with a capital stock of \$250,000 and will take over the property and business of the Western Conduit & Mfg. Company, manufacturer of rigid and flexible conduits for electrical work, made from steel pipe, enameled or galvanized, and also armorite conduits, at Harvey Ill. A new plant will be built at Youngstown, Ohio, on a 10-acre tract adjacent to the property of the Automatic Sprinkler Company. It is the intention of the company to eventually concentrate all its manufacturing at Youngstown. L. J. Campbell is president; Richard Garlick, vice-president; George F. Holly, secretary, and C. C. Rose, treasurer.

The U. S. Metal & Mfg. Company, 165 Broadway, New York City, announces that on July 1 it took over the account of the Pollack Steel Company, Cincinnati, Ohio, manufacturer of heat-treated traction axles, tender and driving axles, crank pins, side and driving rods, equalizers, and, in fact, all classes of forgings in both iron and steel.

# Corrosion of Iron and Steel\*

### Experiments to Confirm the Electrolytic Theory

BY WILLIAM R. FLEMING.

There can be no doubt that the presence of acids (chiefly carbonic) has much to do with the rapid corrosion of our iron and steel. Without acids in our air and water the corrosion problem would be less formidable. This, however, is only a quantitative view-point. In attempting to get at the facts concerning the true cause of corrosion we should not allow ourselves to be blinded by mere quantitative ideas. Given pure iron in pure air and water, the factor of corrosion is very small. Likewise, with impure iron in impure air and water, the factor of corrosion is very great. But this does not interest us. We are concerned only with the true starting point of corrosion.

# Influence of Temperature on Corrosion

Experiments were conducted with apparatus shown in the accompanying diagram. The letters I and S represent

hollow metal blocks, I X I X I1/2 in., with a 34-in. hole 11/4 in. deep. The samples in all cases received their final polishing on oooo French emery paper. The metal samples are connected by tubes for the circulation of cold water within them. The purifying train consists A, dilute sulphuric of: acid; K<sub>1</sub>, 50 per cent. potassium hydrate; 'Ks, 50 per cent. potassium hydrate; So, Soda lime; (the tube connecting bottle and train extends just to the bottom of the large rubber stopper); Sy, is a syphon; C1, clamp on purifying train; C2, clamp on syphon; Ca, large iron clamp for bolting down the rubber stopper.

In experiment No. 1 the genuine open hearth iron and ordinary mild open hearth steel were used and showed the following chemical constituents:

The water in the bath began to boil and cold water was made to circulate through the glass tubes and samples. Water immediately began dripping from the samples.

The experiment was continued 35 days. The water in

The experiment was continued 35 days. The water in the bath was boiling every minute during the whole period. Likewise, cold water was circulating rapidly through the condensing system. The temperature of the ingoing water was 4 to 5 deg. C. The temperature of the water leaving the system varied from 10 to 15 deg. C. At no time did it exceed 15 deg. From this the temperature of the metal samples was presumed to be about 8 to 12 deg. C. The temperature of the pure condensed water vapor on their surfaces was probably but slightly higher. These conditions were maintained every minute during the 35 days.

At the end of the 35 days not the slightest spot of rust or discoloration of any kind was visible on either the pure iron or the steel. Under the samples a ring of rust was formed by contact with the rubber stopper. This, of course, must be disregarded. The surface area of the top and four sides of each sample was 7 sq. in. It is remarkable to think that 14 sq. in. of iron and steel can be ex-

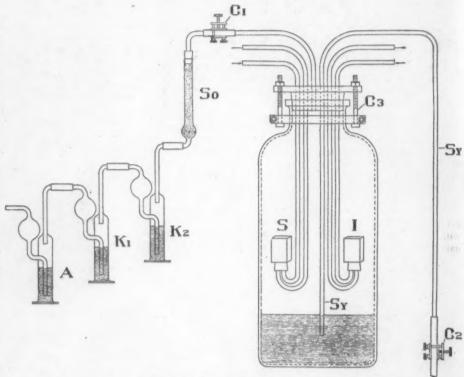


Diagram of the Corrosion Testing Apparatus

The bottle (2½ liters) was completely filled with saturated barium hydrate solution, recently boiled and filtered. The large rubber stopper carrying the four condensing tubes (with samples attached), syphon, and purifying train, was fitted tightly and bolted down securely by means of clamp C<sub>6</sub>. No air bubbles were visible in the apparatus. The bottle was placed in a cold water bath and heat applied. C<sub>2</sub> was closed, and C<sub>1</sub> opened. The expanding solution filled the tube connecting the bottle and purifying train. Thus all air was expelled, and the necessity of removing carbon dioxide from the apparatus by mere shaking avoided.

Then C<sub>1</sub> was closed and C<sub>2</sub> was opened to allow the expanding solution to fill the syphon. The solution was then syphoned off by opening C<sub>1</sub> just enough to allow the incoming air to bubble through the purifying train at the rate of four or five bubbles per second. When syphoned to the level indicated in the diagram the clamp, C<sub>2</sub>, on the syphon, was tightly closed, and C<sub>1</sub> was left slightly open to avoid undue pressure or rarity of the air in the apparatus. The rubber stopper and all connections were well paraffined.

posed for 35 days to pure air and water combined without developing the slightest sign of a rust spot.

This proves that iron or steel will not rust in pure air and water combined, provided the temperature of the metal does not exceed 15 deg. C. (59 deg. F.), and provided the temperature of the pure water condensing on its surface does not much exceed 15 deg.; provided, also, that the pure water which condenses on their surfaces is being constantly renewed. Beyond this, the experiment proves nothing. It simply indicates that pure iron or steel will not rust in pure air and water combined.

#### Rust Obtained in Pure Water and Air

At the end of 35 days the source of heat was removed and the apparatus taken out of the water bath. The circulation of the cold condensing water was continued until the barium hydrate solution had reached room temperature. The condensing system was then shut off. In a few hours the entire apparatus had reached room temperature, about 22 deg. C. The metal samples were left covered with pure water, the flat tops completely, the sides with irregularly distributed patches or globules. This same water was destined to remain on the iron and steel until removed by natural evaporation at room temperature.

In 15 hr. the steel had developed 33 distinct rust spots and all of these spots were on areas covered with the pure water. The pure open hearth iron was still spotless. After

<sup>\*</sup>From a paper read before the Cincinnati section of the American Chemical Society. /†Chemist and metallurgist, Newport Rolling Mill Company, Newport, Ky.

24 hr. contact with the same water at 22 deg. the steel contained about 50 spots; the iron was still rustless. At the end of 72 hr. the water had entirely evaporated from the sides of both metals. The tops were still covered with a thin layer of water. A few new spots had developed on the steel, but no rust had yet appeared on the iron.

At the end of 80 hr. the water had evaporated entirely from the tops. Two large glaring spots of rust had developed on the top of the iron within the last 8 hr. More than 72 hr. contact with the same water at 22 deg. was necessary to produce rust on the pure open hearth iron. Less than 15 hr. contact with the same water produced rust on the steel

Iron or steel will rust in pure water and air combined if it is given a chance. The two most important factors which influence the development of rust are: First, the temperature of the metal and of the pure water on its surface; second, the rate at which the pure water is renewed, changed, on the surface of the metal.

The same samples were repolished and the experiment repeated, except that the apparatus was kept in boiling water for 6 days instead of 35. Again, not the slightest sign of a rust spot developed on either sample. Apparatus was then, as the second part of the second experiment, cooled to room temperature as before. Rust developed in almost the same time on both the iron and steel; the iron requiring 90 hr. contact with the same water, the steel about 16 hr. The location of the rust spots does not seem to be determined entirely by impurities in the metal, but also by the distribution of the water patches on the surface.

This and a number of other experiments [reported in the paper] clearly demonstrate that pure open hearth iron and steel will rust, and rust badly, in pure water and air combined, provided the temperature of the metal and water on its surface is sufficiently high. They further prove that rust develops much faster on steel (impure iron) than on pure open hearth iron. This is in strict accordance with the electrolytic theory.

Acids are only accelerators of corrosion. They are not the cause. The true starting point of corrosion is the solubility of iron in pure water, its electrolytic solution pressure. This property was given iron by nature, and with all our controversy we cannot take away that which nature gave.

#### General Conclusions

Pure iron or steel will rust in pure water and air combined, provided the temperature of the metal and pure water is not below 22 deg. C., and provided the same water remains for a sufficient time on the metals.

Rust is developed rapidly if the temperature of the metals and pure water is about 55 deg. C.

Still further increase in temperature results in a decided increase in the rate of corrosion.

The same pure water may remain on the metal for an indefinite period, and no rusting take place, provided the temperature of water and metal is sufficiently low.

In general, pure iron or steel will rust in pure water and air combined, free from all traces of acids. The amount of rust produced is a function of the temperature and of the purity of the iron.

The "acid" theory of corrosion is untenable.

All phenomena observed in these experiments are in perfect harmony with the electrolytic theory.

# Molders' Monument to Martin Fox

With speakers representing both capital and labor, a monument erected in Calvary Cemetery, Cincinnati, Ohio, to the memory of the late Martin Fox, from 1890 to 1903 president of the International Molders' Union, was formally dedicated on Friday, July 5. Joseph F. Valentine, present president of the International Molders' Union, made an address after unveiling the monument and introduced Samuel Gompers, president of the American Federation of Labor. Lazard Kahn, president of the Estate Stove Company, Hamilton, Ohio, representing manufacturers, paid a glowing tribute to his friend and associate in the settlement of labor questions in the stove trade. John P. Frey, editor of the International Molders' Journal, made the dedicatory address. A number of visitors from Cleveland, Columbus, Dayton and other cities were in attendance.

# Rust Resisting Control for Fire Pump Motors

For use with automatic fire extinguishing sprinkler systems or with water fire-fighting systems generally, the General Electric Company has designed a fire pump motor control panel which has bearings provided with non-corrosive parts so that rust cannot develop and prevent starting a motor after long disuse. The complete panel is enclosed in a splashproof case to protect it from dripping water and also to prevent the entrance of water if a stream from a fire hose should strike it. The panel is mounted on four pipe supports so that it cannot be reached by water accumulating in the basement where the panel is generally installed.

A pressure governor, connected to the water pressure system closes the control circuit of the panel. As soon as the water pressure falls to a predetermined value the motor is started with all the starting resistance in circuit. Current limit contactors automatically accelerate the motor by cutting out succesive steps of this resistance. If desired the motor may be started by hand by means of the operating lever at the right of the contactor. This method forces the contactors to close in their proper sequence by means of a cam shaft.

The panel is protected against failure of voltage and also from overloading. Two lamps are mounted on the panel, the one serving to indicate when there is voltage on the line, while the other indicates to the operator that the motor is running. The lights are visible through glass bulls' eyes in the enclosing cover. The contractors which open the main line circuit are provided with powerful magnetic blow-outs which snuff out the arc when the circuit is opened and serve to prevent any burning of contactor parts. There is a similar panel for controlling the slip ring type of induction motors, where automatic control is obtained by means of a motor operated dial switch. The latter may also be operated by hand if desired.

It is estimated that the property loss in the United States from fires during the last 33 years totals the enormous sum of \$5,147,253,724. The magnitude of this loss is almost inconceivable, yet an idea of it may be gained from the fact that this sum is equal to 1/25 of the present wealth of the United States. This sum, if in silver dollars placed side by side, would reach around the earth nearly five times or to carry them would require a freight train 38½ miles long, if made up of cars of 60,000 lb. capacity and 40 ft. long.

# A Record Month in Lake Superior Iron Ore

A record for a single month in Lake Superior ore shipments was made in June with a total of 7,567,555 gross tons, which is more than 250,000 tons in excess of the best previous record of 7,316,592 tons made in June, 1910. The total for June of last year was 4,819,966 tons. To July I this year shipments were 13,690,671 tons, against 8,836,372 tons to July I, 1911, an increase of 4,854,299 tons or 55 per cent. The shipments by ports in June, 1912 and 1911, and the totals to July I, in the two years, were as follows, gross tons:

	June,	June,	To J	
Escanaba Marquette Ashlard Superior Duluth Two Harbors	1912. 849,059 561,976 811,029 2,348,608 1,551,214 1,445,669	1911. 538,168 314,807 394,555 1,629,112 1,102,979 840,345	1912. 1,641,948 918,890 1,332,801 4,344,331 2,845,478 2,607,223	1911. 1,067,708 \$33,738 662,412 2,944,954 2,050,134 1,577,426
	7,567,555	4,819,966	13,690,671	8,836,372

Mixed Pressure Turbines in Steel Works.—The mixed-pressure turbine installation of the Tennessee Coal, Iron & Railroad Company is described by E. J. Best, chief engineer of the company at Ensley, Ala., in the General Electric Review for July, published by the General Electric Company's Publication Bureau, Schenetiady, N. Y.

The power plant is understood to embrace the largest installation of mixed-pressure turbo-generators and equipment concentrated in one house for the utilization of exhaust steam from rolling-mill engines. The same issue contains an article describing a mixed-pressure turbine installation at a steel works where there is a 7000 kw. Curtis turbine arranged to operate on 140 lb. high-pressure steam or 16-lb. low-pressure steam under a vacuum of 28½ in. or both.

# Drilling the Panama Lock Gates

For the final riveting of the large lock gates of the Panama Canal the McClintic-Marshall Construction Company, Pittsburgh, Pa., installed 16 special electrically-operated machines for drilling and reaming the rivet holes. Each of these machines weighs about six tons and is capable of doing the work of five of the ordinary type reaming machines. They were designed and built by the Foote-Burt Company, Cleveland, Ohio, especially for use on the canal and are distinguished by a great capacity, a wide speed range and the use of fixed spindles arranged to suit the uniform rivet spacing in the lock gates. Fig I shows one of these machines drilling holes in the plates of which the lock gates are composed, while Fig. 2 is a view of one of the machines itself.

The machines are designed to run on a standard gauge track and are mounted on broad adjustable scaffolds which are suspended from brackets by chains from the top of the gate as shown in Fig. 1. The inclined handwheel shown in Fig. 2 operates through a train of gears and moves the machine along the track, the movement being easily accomplished as roller bearings are employed. It will be noticed that the entire controlling mechanism is placed within easy reach of the operator, the horizontal handwheel raising or lowering the spindles through reduction gearing and a screw, while the quick return motion of the spindles is controlled by any of the four levers shown which automatically engage the quick return mechanism and enable the spindles to be run in and out.

Each machine has a total of nine speeds varying from very slow for heavy drilling to very high for lighter reaming. Four changes of power feed are provided and these are instantly available through the quick change gear mechanism. The length of the power feed is 16 in. and the machine is so arranged that either one or both of the spindles can be fed independently. The clutch lever for placing either spindle in operation can be seen in Fig. 2 directly above the figure 15 on the head of the machine, while the feed lever is seen just above it through the handwheel. This handwheel is used for raising and lowering the head, which is counterbalanced so that these opera-

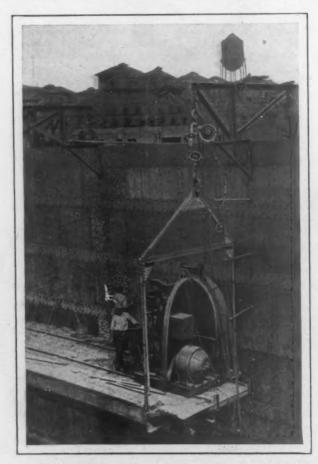


Fig. 1—One of the Sixteen Special Foote-Burt Drilling Machines
Used for Drilling and Reaming the Rivet Holes in the Panama Canal Lock Gates by the McClintic-Marshall
Construction Company, Pittsburgh, Pa.

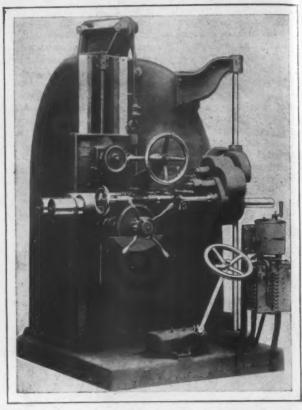


Fig. 2-A View of the Machine Showing the Control Mechanism

tions are performed with the least possible effort. A shackle at the top of the machine which is shown just to the right of the wire cable connecting the head with the counterbalance is used to attach the machine to the crane hook for raising and lowering. The machines are driven by 10-hp. 220-volt direct-current adjustable-speed shunt-wound Westinghouse motors.

These machines were placed in operation in February of this year on the main gates of the upper lock at Gatun, and it is intended to use them on all of the gates in the three sets of locks. In a test made at Gatun, one of the machines drilled I-II6-in, holes through I-in, plates in 4 seconds, or at a rate of 15 in. per minute.

#### Iron and Steel Statistics for 1911

Particular interest attaches to the fact that Part I of the Annual Report of the American Iron and Steel Association, which is soon to be distributed, is dated July 12, and that that date is the 80th birthday anniversary of the general manager of the association, James M. Swank. Some of the statistics for 1911 have already been published in the Bulletin of the association, including those for pig iron, steel ingots and castings and rails. Part I of the report will also give the final figures for some other products, while the statistics of various forms of finished material will be published in Part 2.

While Mr. Swank's office at Philadelphia will gather the statistics of pig iron production for the first half of 1912 in the usual way, the office of Secretary McCleary of the American Iron and Steel Institute, 30 Church street, New York, will collect the figures for the first six months of 1912 for the production of steel ingots, castings and for various forms of finished iron and steel. Blanks have already been sent out for these last-named statistics, and it is the expectation hereafter to collect all statistics semi-annually, whereas the practice heretofore has been to gather and compile semi-annual statistics of pig iron only.

The Brier Hill Steel Company, Youngstown, Ohio, has qualified under the workingmen's compensation act by paying its first premium to the state liability board of awards. This company is one of the largest to qualify up to the present and will pay an annual premium of approximately \$20,000.

# By-Product Coke Ovens in the United States

Cost of Installation, Quality of Product and Late Improvements in Construction Discussed —The Standpoint of Beehive Oven Owners

A valuable discussion of the more recent developments in by-product coke oven construction and operation appears in the last number of the Proceedings of the Engineers' Society of Western Pennsylvania. The paper discussed was presented by William E. Hartman, representing the Koppers oven. Space is not available for a full report of the paper and the comments on it, but we give below extracts from both which embody the salient points.

## Extracts from W. E. Hartman's Paper

The prime requisite in by-product oven coking is uniformity of heating throughout the length of an oven, thus producing coke uniformly coked in a minimum length of time. An oven that is designed to accomplish this purpose to perfection can be operated on the shortest possible coking time, this coking time being limited only by the refractory qualities of the construction material. Without this uniformity of heating, it is impossible to make any decided reduction in coking time, because of the danger of either overcoking or undercoking some of the charge, both of which faults are detrimental to the quality of the coke. Another feature of overcoking sometimes encountered is the difficulty of pushing the charge, due to the excessive amount of fracture resulting in fine coke or breeze.

It has been found that reducing the coke time from 24 hours to 16 hours for the charge results in a considerable improvement in the coke, this result being testified to by the blast furnace departments. Shortening the coking time increases the porosity of the coke without decreasing its crushing strength. The product is, therefore, better adapted for furnace use. The writer confidently believes that we will before long see the time when by-product coke ovens are operated on 12 hours coking time. Such results could not be accomplished were it not for the introduction of silica material in oven construction—material with about 96 per cent. SiO<sub>2</sub>. There was great fear of the danger due to this highly expanding brick, which expansion is about ½ in. to the foot, and in the length of the 70-oven battery, 35 in. It was predicted and expected by some coke oven people that the end ovens of the battery would be pushed off the foundations, but we are glad to say that we were able to take care of this pronounced expansion. The great advantage of this highly refractory material is the fact that we are able to increase the coking temperature in connection with decreasing the coking time, without the danger incidental to the use of less refractory material.

Another feature of note in by-product coking is the increase in the size of ovens. The ovens built at Joliet in 1907-1908 were designed with a capacity of 10½ tons per charge, and these were then considered large ovens. The ovens of the same type, built since this, have been 12¾ or 13¾ tons capacity per charge. Our standard oven at this date is 15 tons per charge. It would be folly, however, to try to make such decided increases in oven capacity unless the design of the oven provided for uniformity of coking throughout the length of the oven. This 15-ton oven referred to is 40 ft. long between doors, 11 ft. high and has an average width of 19 in.

#### First Cost and Life of By-Product Coke Ovens

When beehive ovens can be built for \$700 to \$800 per oven, including all machinery, while a by-product oven plant costs \$12,000 to \$18,000 per oven, and the oven battery itself costs about half of this, it is not to be wondered at that the appearance of the first cost is discouraging. But on further consideration we find that the beehive oven that we are figuring on receives a charge of perhaps 6 tons of coal every 48 hours, while the up-to-date by-product coke oven cokes its charge of 15 tons in from 15 to 18 hours. With this sized by-product oven and this coking time, it has been found that the cost of construction of a by-product oven is about the same, or a little less than the cost of the beehive oven, figured on the basis of coke production. By this we mean that the cost of

the by-product oven battery, including all of its machinery, piping, etc., but excluding that part of the plant for handling and recovering the by-products, compares favorably with the total cost of a battery of beehive ovens, when figured per ton of coke produced.

We have batteries that have been in operation 10 years without any oven wall repairs. Aside from minor repairs, the walls receive the most severe treatment. Again, the writer saw a plant in England where it is necessary to rebuild the oven walls about every two years, due to the fact that the coal used is high in alkaline salts, which unite chemically with the silica of the wall brick. Some coals in this country would result in this same difficulty, but the most of our coals are low in alkaline salts and we can figure on a reasonably long life for oven walls. The battery of silica material at Joliet has been in operation now for about 3½ years, and to all appearances it is good for at least 3½ years more without repairs.

#### Kind of Coal

Due to the Steel Corporation's experience with low volatile coal at Joliet, it has come to be generally believed that the best quality of blast furnace coke could only be made by using a low volatile coal or mixture of coals. The coal used at Joliet was for a long time 80 per cent. Pocahontas and 20 per cent. Ronco, making the volatile content of the mixture about 20 per cent. More recently Illinois coal was substituted for the Ronco, and more recently still they had a month's run of 60 per cent. Pocahontas and 40 per cent. Klondike. This mixture had a volatile content of about 25 per cent., and it is interesting to note that this coal mixture produced coke far superior to that formerly made. The porosity was higher and the blast furnace results were decidedly improved. There is a by-product coke oven plant at Duluth, using in the ovens ¾ in. screenings from Pittsburgh coal. This has a volatile content of 34 or 35 per cent., and the coke gives very good results in their blast furnaces, the blast furnaces being relatively small.

We have in Germany a large number of plants operating with washed coal containing from 10 to 12 per cent. moisture and from 14 to 16 per cent. volatile matter. It is not generally known that coal of this kind can be used without having trouble from expansion during coking, but we have no such difficulties, and we attribute it largely to the fact that the coking processes take place uniformly throughout the length of the oven and thus we have no part of the charge overcoked. This overcoking would result in excessive formation of breeze, which would interfere with pushing the charge.

The specific gravity of the coal has an important bearing on the subject. We have several plants operating in England using very light coal and the volatile content is about 30 per cent. In order to make metallurgical coke from this light coal it is necessary to compress the coal by stamping it into a cake before charging, while in this country there are a number of plants making good metallurgical coke from 30 per cent. volatile coal without any such troublesome treatment of the coal before charging

Another important characteristic of coals is the oxygen content. A coal that is high in oxygen requires a relatively high temperature and longer time for coking, and gives trouble through an excessive formation of carbon in the oven and pipes. Also, the gas yield is lower and the quality of the gas is poorer, so that all things considered it has been found that high oxygen in coal is much more objectionable than high ash content.

#### Quenching and Screening of Coke

It is essential that the moisture content of the quenched coke should be very low. In Europe the writer found most of the plants pushing their coke on a wide level wharf; here the coke was quenched with a hose and wheeled by barrows into railroad cars. In some cases this was improved by having an inclined wharf, thus reducing the labor item. It may be said that this method did not result in low moisture coke, and would be, with our high cost of labor, an expensive method of handling. In this country we have had the greatest amount of success by using a quenching car. The coke is pushed directly from the ovens into a long open car, preferably lined with cast iron. In such cases the coke is quenched by a large overhead stream immediately after the coke falls into the car. It has been found, however, that quenching the coke right at the ovens is open to objections, because of the large amount of steam produced, this steam having an injurious action on the oven steelwork and brickwork, as well as being disagreeable to the operators, so that the tendency now is to push the coke into such an open quenching car and immediately take this car away to be quenched at a quenching station slightly removed from the battery. It has been recently suggested that quenching can be still more efficiently accomplished with lower resulting moisture if hot water is used, and we are experimenting along this line. The necessity for further improvement in quenching methods is evident from the fact that one by-product coke oven plant has recently contracted for a part of its output on a moisture specification of I per cent.

It has only recently been demonstrated that it is poor policy to use run-of-oven coke in blast furnaces. Plants are now being equipped with facilities for screening, and in some cases for crushing and screening their product. Regarding screens, various types have been used, including straight bar, shaking bar and revolving screens. Of these the revolving screen is without doubt the most efficient. A revolving screen not only screens thoroughly but also breaks off any loose particles of coke which would otherwise become fine coke in the blast furnace or The Steel Corporation's coke plant at Joliet and cupola. their blast furnaces have demonstrated to their satisfaction that it is exceedingly advantageous to use only thoroughly cleaned coke, reduced in size to 2 in. or less.

#### By-Products and Surplus Gas

It has been predicted that with the increasing introduction of by-product ovens, the market prices of tar and ammonium sulphate would be rapidly lowered People have been predicting this for the last 10 years, and yet the fact is that prices for these products have been steadily increasing. This is explained by the rapid development of the market, due to the increasing uses for these products. One of the recently developed fields for coke oven tar is its use in Diesel engines, and engines of this type of a capacity of 5000 hp. and over are in successful use on tar. Tar is previously treated only for the removal

Regarding the surplus gas, it has been found that this can be advantageously used wherever gaseous fuel, either producer gas, blast furnace gas or natural gas, has found application. In this connection we have recently introduced what is known as our "gas ovens" and "combination ovens." The combination oven has been adopted by a number of steel plants in Germany, the oven being heated with blast furnace gas and all of the gas from the coal being used in the various departments of their steel plants. Among these applications is its use as open hearth fuel. Germany has made more progress in this direction than this country, and has demonstrated clearly that coke oven gas is well adapted for this purpose. An interesting recent contribution on this subject was published in Stahl und Eisen, December 7, 1911, and December 21, 1911, and translated in The Iron Age, February 8, 1912.

# Discussion by Correspondence F. F. Marquand1

The statement Mr. Hartman makes regarding the rapid evolution of by-product coke oven construction is not in the least exaggerated. Ten years ago when the United

<sup>1</sup>Superintendent coke works department, South Sharon Steel Works, Carnegie Steel Company, South Sharon, Pa.

Coke & Gas Company built our plant of 212 Otto-Hoffman ovens at South Sharon our ovens were the largest by product ovens built up to that time: 42 ft. long, 171/2 in. wide and 7 ft. high, taking a charge of 9.12 net tons coal. The ovens were operated with considerable difficulty at first, and for a time it was feared the plant was a failure because of the excessive size and difficulty of heat control. However, many détails have been worked out which have put us on an efficient and profitable operating basis, and today, instead of being too large to be efficient competitors in the corporation coke making, we are too small a unit. Joliet has exceeded us in size of oven and Gary has exceeded Joliet in about the same proportion. We today are operating our ovens on a mixture of 65 per cent. Klondike and 35 per cent. Pocahontas

coal, having an average of 25.5 per cent, volatile matter. We have steadily maintained a coking time of 24 hours, but within the past month we have reduced the coking time to 201/2 hours, with very encouraging results. Our blast furnaces, which are operating on all Sharon by-product coke, responded immediately by increasing iron yield and smoother working. The coke is slightly larger,

more porous and tougher.

It is folly to compare by-product coke made from an inferior coal with beehive coke made from the best Connellsville coal, but this very thing they have been doing time and again. The coke quality today is of prime importance. Thus the by-product coke of today, where it is made for metallurgical fuel, is far superior to the byproduct coke made 10 years ago; first, because the coal for making this coke has been thoroughly studied, and second, the heating conditions are very much higher and more uniform.

The oxygen in coal has a most deleterious effect on the quality of coke; for this reason coals which have been subjected to weathering, such as coal carried on stockpiles, even for as short a period as four or five weeks, have a pronounced effect upon both the quality of the gas and coke produced. The shorter the interval of time from the mines to the ovens, the better the coking results will be.

#### Results from Reduced Coking Time

In the reduction of our coking time from 24 hours to 201/2 hours I have observed that we got a quality of coke which enabled the blast furnaces to work more rapidly and more smoothly. However, it had a tendency to increase the amount of coke used per ton of iron produced. This, however, on so small a period of time is not conclusive evidence. I also found that our tar yield was reduced from 7 gal. per net ton of coal to 53/4 gal., and we had an increase amount of napthaline to content with in the house. Our ammonia yield decreased from 4.75 lb. NH<sub>3</sub> per net ton of coal to 4.4 lb. Our surplus gas yield increasel from 3000 cu. ft. per net ton coal to 4600 cu. ft. Our total gas was about the same, 12,000 cu. ft. per net ton. Thus it took no more gas per hour to heat the ovens on a 201/2-hour coking time than it took on a 24-hour coking time. However, the higher heated walls enabled us to burn this quantity of gas more efficiently in the oven flues, rather than allow it to be carried down to the regenerator below.

I believe our yields of tar, ammonia and gas will be proportionately affected as the coking time is reduced still further, so that a time will doubtless be reached when the heat necessary to produce a shorter coking time will effect, on the whole, a loss rather than a gain when

all factors are accounted for.

The result of our practice shows that we get a yield of 76 per cent. dry furnace coke and 3 per cent. dry breeze from a coal mixture having 25.5 per cent, volatile matter, which shows that 4.5 per cent. of the volatile matter driven off in the laboratory test is converted into coke in the by-product oven, while, on the other hand, in the beehive ovens the coke yield is 3 to 6 per cent. less than the results as shown by laboratory analysis of the coals carbonized; which makes a saving in the coke yield from by-product ovens of from 7 to 10 per cent. more than the coke yield from beehive ovens coking from the same coal.

#### Dr. Richard Moldenke<sup>2</sup>

It is to be hoped Mr. Hartman's paper may assist in checking the enormous waste now going on by coking

<sup>\*</sup>Secretary American Foundrymen's Association.

in beehive ovens. The paper is naturally written with an idea of emphasizing the possibilities of commercial economy. Hence it appeals more particularly to the blast furnace man. The foundryman will take exception to some of the statements. "Shortening the coking time increases the porosity of the coke" is undoubtedly correct; "without decreasing its crushing strength" is open for discussion, as quite the opposite has been observed on occasion. Increasing the porosity of the coke is what the furnaceman wants, as he wishes to make all the gas he can' (carbonic oxide). The foundryman, on the other hand, wants to get a coke with a minimum of cell space, as he wishes to produce complete combustion and keep it that way (carbon dioxide, with the consequent very much higher temperatures). Hence the foundry trade, with an annual consumption of possibly a million and a quarter tons of coke, will not welcome a reduction in the coking time either in the by-product or the beehive oven.

Mr. Hartman is perfectly right in attributing this possibility of getting a greater percentage of cell structure to the higher temperatures now attainable in by-product ovens (of other makes as well as his own). The same condition is observed in the beehive oven, where the admission of more or less draft through the door hastens or retards the cell-making of the coke produced. It is a well-known fact that the cell structure of a coke is attained in the first 24 hours in the beehive oven.

Mr. Hartman is in error when he states it as generally believed that the Steel Corporation's experience with low volatile coals indicated that the best cokes were made that way. Quite the contrary, for it was generally believed that much of the trouble known to exist at the Joliet plant was due to the comparatively low volatile coals used. Mr. Hartman admits this practically, in stating that better results were obtained with the volatile at 25 per cent.

As a matter of fact, every by-product plant has its own experience and consequent standard for volatile. One plant I know of holds to 29 per cent., while another wants 25 per cent., and still another 30 per cent. One great advantage of the by-product system, due to the localities so far selected for business reasons, is the ability to mix the coals. In this way ideal coke conditions are obtainable, as a variety of coal markets can usually be drawn upon. At the beehive plants this is impossible. They serve only the coal mines of the region.

#### J. L. Haehnlen<sup>3</sup>

At the present stage of the industry there are, in my opinion, two phases of the question which call for more thorough and conscientious investigation than has yet been attempted. First, we must get more exact knowledge of the thermal conditions existing in the coking mass itself, at all points, during the complete cycle of coking. Some tests have been made along this line, but they are very incomplete. Then, secondly, we need further investigation of the physical properties of the refractory materials entering into the construction of oven walls, etc. Splendid work has been done along this line by Wologdine, Dewey, Clements, Egy, Ray, Kreisinger and several others, some of whose reports have not been published; but more work remains to be done, especially materials with which we have to work. We do not know all we should about the flow of heat through oven walls, and upon these two phases, so closely allied, depends the further reduction of coking time as touched upon by Mr. Hartman.

Considering the industry as a whole, in the broadest light and from the viewpoint of the iron manufacturer, who naturally compares the cost of installation of the plant with the value of the product, as for example in the case of the blast furnace, the first cost of the by-product oven is excessively high. It is, therefore, to be hoped that in the not far distant future a simple type of oven, not necessarily along the present lines, but of greater productive capacity and less cost, will be brought forward.

#### W. O. White

Concerning the return on the investment required for an up-to-date by-product coke plant erected in connection with a large steel plant there is, of course, no question. Viewing the situation from the standpoint of the individual or corporation which intends to operate a large tract of coking coal as a coke operation pure and simple, then the question which presents itself to me is this: Will the return on the investment warrant by-product coke oven construction?

My opinion is that the smoke which now goes to waste and denudes the country surrounding our coke regions of vegetation can be more profitably used in a regenerative type of coke oven than in a by-product oven. A plant constructed along this line would be one in which the coking period would be greatly shortened, while also there would be a very considerable excess of heat which can in many localities be converted into electrical power at a comparatively small additional cost of investment.

#### E. W. Parker<sup>5</sup>

As Mr. Hartman justly states, the development of the by-product or retort method of coke making in the United States has been retarded, first, by the high cost of installation, and second, by the apprehension on the part of the by-product oven people themselves that the markets for the by-products, with the exception of gas, would be demoralized. This was principally feared in regard to tar. There was at that time, say 15 to 20 years ago, no briquetting industry in the United States and hardly any thought of one as such, although some sporadic attempts had been made to establish plants for the briquetting of There was no demand for creosoting anthracite dust. oils, and we were so sure of our inexhaustible supply of timber suitable for ties and for bridge material that no thought was given to its preservation by the use of creo-sote. There was no chemical industry dependent upon coal tar as a raw material and the latter is still sadly wanting, the United States being far behind Germany in the utilization of coal tar products. The others are coming up.

There is now a large and growing demand for creosoting oils, the principal complaint being that the distillers of coal tar are not alive to the exact requirements of the creosote users and do not exercise the care necessary to produce the grade of creosoting oil required. There is also an exactness which should be maintained in regard to the production of the coal tar pitch required by the briquetting people. The principal demand heretofore in this country has been for roofing papers and materials of this kind, and that has been the market to which the coal tar distillers have catered.

I am glad to note what Mr. Hartman states in regard to the increasing demand and price for the by-products. This is also somewhat in line with the prediction I made some years ago, which was to the effect that with an ample supply of raw materials in sight the industries dependent upon them would develop and the demand increase.

### PREJUDICE AGAINST BY-PRODUCT COKE DISAPPEARING.

The prejudice against by-product coke, which was much in evidence 12 or 15 years ago, is disappearing. masters accustomed to the beautiful silver luster of Connellsville coke concluded that any other coke not having such luster was of inferior quality, and it was immediately condemned. There was no thought of making a change in the blast furnace charge or other conditions to meet the new field, and if the by-product coke did not behave exactly the same way in the furnace as Connellsville coke the wisdom of the condemnation was proved. The best answer to this proposition is to cite the record at Johns-The first plant of Otto-Hoffman ovens was erected town. by the then Cambria Iron Company in November, 1895. This was of 60 ovens, and the second installation of 100 ovens was completed in March, 1899; the third, also of 100 ovens, was completed in September, 1904, and the fourth, of 112 ovens, was completed in 1907. An organiza-tion controlled by such men as those of the Cambria Steel Company would not have made these different installations if by-product coke had not been found satisfactory in its own furnaces and if the operations had not been profitable, cost of installation, maintenance and everything else considered.

The first plant of Semet-Solvay ovens, at Syracuse, N. Y., which was the first bank of by-product ovens to be constructed in the United States, has been twice en-

<sup>&</sup>quot;Superintendent by product coke oven department, Woodward Iron Company, Woodward, Ala.
"Civil and mining engineer, Uniontown, Pa.

Statistician U. S. Geological Survey, Washington, D. C.

larged. Another instance I might cite is the installation of Koppers ovens at Las Esperanzas, Mexico. These are waste-heating and not by-product recovery ovens, but with the exception of the by-product recovery the principle is the same. The company secures from 50 ovens practically all the tar necessary for the operation of its plant. It has increased its yield of coal and coke from 15 to 16 per cent., and "48-hour" coke is made in from 18 to 20 hours. A better price is obtained for the retort oven coke than was obtained for the beehive product formerly made.

The increase in size of batteries cited by Mr. Hartman is interesting and records another instance of the tenin modern industrial enterprises to large units. dency The time for the small, independent individual operator

There are two or three other questions which I should

like to have Mr. Hartman answer:

Whether or not he has found any difference in the output of the ovens if charged with practically dry coal or with coal from the washers, from which the moisture has been only drained off and the charge not entirely dried. I understand that Professor Parr of the University of Illinois has made some interesting experiments with the use of steam in the coking of Illinois coal, and I should like to know if in the use of partially wet coal

in the ovens any difference is observed compared with dry.

2. Mr. Hartman speaks of the desirability of fine crushing of mixed coal. Is it not true that in most cases a more uniform result is obtained if the coal is crushed very fine before being charged into the ovens, whether the

coal should be one kind or mixed?

3. In speaking of the use of blast furnace gas in the heating of the ovens: Has it been found that the blast furnace gas will give as high and uniform heat in oven flues as the oven gas?

# Discussion at the Meeting

#### Dr. F. Schniewind7

Mr. Hartman states that the progressive action of the United States Steel Corporation marks the beginning of the real growth of the by-product coke oven business in this country and that the Steel Corporation's coke committee adopted the Koppers ovens after an investigation of the different types of by-product coke ovens in Europe. This is not correct, as the coke committee of the Steel Corporation made a thorough study of only one type of oven and did not investigate the modern examples of other types of ovens at all; therefore their conclusion can hardly be conclusive. Nevertheless, the Steel Corporation's coke committee rendered a great service to the byproduct coke oven industry by erecting for the first time a by-product coke oven plant without regard to expense. The great difference in cost between beehive ovens and by-product ovens has been the great handicap against the introduction of by-product coke ovens in this country. Everybody was afraid of such large investment until the Steel Corporation proved that if anything the money spent on these ovens up to the time of the erection of the Joliet plant was too small.

The credit for the initiative and progressive foresight looking to the vast economies and possibilities in connection with by-product coke ovens belongs to the officials of the Cambria Steel Company of about fifteen years ago -Powell Stackhouse, C. S. Price and Joseph Morgan.

BETTER BLAST FURNACE USE OF BY-PRODUCT COKE

Mr. Hartman suggests that the quality of coke from by-product coke ovens erected in this country was not al-together satisfactory. This is misleading, as at the time by-product coke ovens were first introduced into this country there existed prejudices in regard to the quality of coke on the part of the blast furnace men. The ideas of blast furnace superintendents in regard to the quality of coke required have undergone material changes, however, and I only point out here what Mr. Hartman also states, that the coke is now being broken before it is charged into I wonder what a blast furnace man would have said in the year 1895 when the first by-product coke oven plant for blast furnace use was built at the Cambria

<sup>7</sup>President United Coke & Gas Company. 17 Battery Place, New York. Communication read by Edwin A. Moore, of the same inter-ests, Camden, N. J.

Steel Company's works if the suggestion had been made to him that he should use only broken coke of egg size. He would never have allowed this material to be charged into his furnace. It is, however, a well-known fact that coke from the ovens described by Mr. Hartman breaks up in unduly small sizes, for which the heating conditions of these ovens are responsble. It was therefore necessary to screen and size this coke. This necessity, according to the author, becomes at once a virtue. I want to be understood that I do not wish to decide here the question whether large or small coke is best for a blast furnace; that the blast furnace operator must decide for himself. I only desire to point out that in these ovens the percentage of coke of small size is larger than in other types of ovens and that all types of ovens can prepare coke of uniform size.

It was proved out long ago that the high volatile coals which made an excellent coke in American beehive ovens would not produce a coke in by-product coke ovens which would meet the specifications given by the average American blast furnace superintendent. In order to whether the objections against the by-product coke are well founded about 3000 tons of coal were coked in United-Otto by-product coke ovens in the year 1898 and were tested in a blast furnace under the supervision of John Fulton and E. A. Uehling. The test proved that per ton of pig iron about 100 lb. less by-product coke was used than beehive coke and that the capacity of the furnace materially increased.

THE QUESTION OF HIGH HEAT AND SHORT COKING TIME.

It would take us too far to discuss at present the various heating systems of coke ovens, but with very much simpler means other types of ovens obtain even a greater uniformity of heating than the type described by the author. This is confirmed by the results at plants in operation. If the short coking time were actually a standard of uniformity of heating I could point out that batteries have operated in 14 hours, not for a day but for months. This naturally greatly increases the daily capacity of a plant; but that it will also decrease the cost per ton of coke to a minimum Mr. Hartman will still have to The destructon of by-product is enormous when the temperature of the ovens is carried above a certain point, and therefore the craze for big capacities may not always be conducive to highest economy.

The first silica material was used about 14 years ago in connection with by-product coke ovens installed by the Cambria Steel Company, at Johnstown, Pa. In our construction for the last ten years the ovens proper have been exclusively built of silica brick.

The first movement for increasing the size of ovens was made in the year 1902 when several plants with ovens 42 ft. 8 in. in length were built. These held a coal charge of over 9 tons against 6 or 7 tons before that time. A number of companies are now building ovens of a 15ton coal charge.

# LOW VOLATILE COALS LONG USED

The speaker of the evening stated that, due to the Steel Corporation's experience with low volatile coal at Joliet, it has come to be generally believed that the best quality of blast furnace coke could only be made by using a low volatile coal or mixture of coals. This experience was gained at the Cambria Steel Company's plant about 14 years before that time. The Johnstown coal is lower in volatile matter than the Pocahontas and has been used at Johnstown continuously. At that place one great additional trouble occurs, however, the coal is so full of impurities that it requires washing and the charging of the wet coal naturally increases the repair expense of the

It may be said that the direct process for the recovery of ammonia referred to by Mr. Hartman is only a semidirect process because it does not dispense entirely with the ammonia still. There are other by-product coke ovens that have developed true direct processes which are in very successful operation in Europe and which are available also for American plants. It should, however, be borne in mind that the market conditions for ammonia do not in all instances make the exclusive manufacture of sulphate of ammonia advisable.

The market for by-products resulting from the use of by-product coke ovens has been very rapidly developed within the past few years, particularly for tar products, and the use of tar for the generation of power will play a very important part within the next few years. enormous demands made, which are annually increasing, for high class fertilizers point conclusively to the fact that the market for sulphate of ammonia will share in the upward tendency. The farmers are getting to appreciate more fully the great value of fertilizers blended with sulphate of ammonia. In fact there need not be any fear that the demand for all of the products-namely, tar, ammonia and gas-will be, under normal conditions quite equal to the supply.

#### COKE OVEN GAS PLANTS

Undoubtedly the most notable example of the use of by-product coke oven gas in the world is the plant we installed at Camden. From this center a district extending more than 100 miles northerly through the State of New Jersey is covered. The principal cities and towns served are Camden, Trenton, Princeton, New Brunswick, Plainfield, Perth Amboy and the intermediate districts. gas is forced under high pressure throughout the entire distance by a compressor plant connected with the central plant at Camden. The average heat value of the gas throughout the entire district will not fall below 640 B.t.u. No extra enrichment is required for the gas, and it more than meets the demands of the usual requirements of State laws covering the heat value and candle-power of coal gas.

The most modern plant for the supply of gas to city service was erected by our company for the Citizens' Gas Company, at Indianapolis, Ind., and has been in operation more than two and a half years. The gas is used to re-place that which was supplied for a number of years by natural gas. The franchise requirements in connection with the distribution system required the high heat value of 600 B.t.u. A careful investigation by the officials of the company led to the adoption of the by-product coke ovens of the United-Otto system to meet these requirements. During the winter season just passed (1911-1912), the most severe winter for many years, the company was able to keep up its supply to its customers, and the heat value, except in one or two instances, did not fall below The candle-power was constantly maintained at more than the average requirements.

These particular instances will serve well to indicate the possibilities in connection with the utilization of byproduct coke oven gas for lighting, heating and cooking purposes throughout large populous districts. There can be no end to the demand for gas which can be supplied to industrial establishments in connection with industries where by-product coke ovens are installed.

It may be of interest to some of those present to know that the development of the gas supplied at Camden has required more than doubling the gas capacity of the original plant. This, however, has been accomplished by the addition of only 50 ovens as compared with the original installation of 100 ovens, which instantly gives an idea of the development of the productive capacity of the ovens although nominally of the same size as compared with the practice of about 12 years ago. The plant of the Citizens' Gas Company at Indianapolis is being doubled at this time

There are many features in connection with the byproduct coke ovens which might be greatly enlarged upon if time permitted. The subjects worthy of larger scope of presentation are:

The development and advantages of silica bricks.

The special importance of the tightness of the ovens where the manufacture of illuminating gas is involved. Incident to this feature is the necessity for the grinding of bricks used in the oven wall construction.

The development of heavy oven walls was made apparent many years ago in connection with the construction of the ovens for the Cambria Steel Company, brought about by the requirements for the treatment of the low volatile coal of a swelling nature which is used by them.

Recognition of the demands for reduced operating expenses evolved from a larger output capacity was apparent about 12 years ago. This led to the installation of several plants under the United-Otto system of ovens about 43 ft.

long with a charging capacity of about nine tons and a coking time of about 20 hours.

#### R. T. Hapgood'

I might call attention to some tests I carried out several years ago, to determine the relative strength of beehive and by-product coke when subjected to physical tests intended to duplicate as nearly as possible the handling of coke between the time it leaves the oven and its final consumption in the furnace.

Pittsburgh vein coal, containing about 33 per cent. volatile matter and 10 per cent. ash, was coked in two bee-hive and two by-product coke ovens. One ton of selected One ton of selected large pieces from each oven was used for each test. The was placed in a box, approximately 4 ft. on a and having a drop bottom, and elevated to a hight of The drop bottom was then opened and the coke allowed to fall at once on an iron plate. This procedure was repeated seven times and the coke then screened to sizes from 1/2 in. to 5 in. After the different sizes had been weighed they were carefully mixed together and then tumbled in a barrel. The barrel was revolved on its long axis, but off center, in order to give the coke more of a tumbling effect. Six or eight shovelsful of coke were used at once and the barrel revolved eight times. The coke was then screened and, after weighing, carefully mixed, and subjected to the crushing test. This was done by filling an iron box I ft. on a side with coke, and then allowing a 7500 lb. weight to rest upon the cover, which just fitted inside the box. After all the coke had been treated in this manner it was screened and the various sizes weighed. All coke remaining on the 1-in. screen or larger was considered furnace coke. From these four tests approximately 66 and 68 per cent. of furnace coke was obtained from the beehive coke and 76 to 78 per cent. from the by-product coke.

#### Pittsburgh Vein Coal and By-Product Coke

J. W. Dougherty': I wish to ask if it would be pos sible in a by-product coke oven, properly designed, to make a satisfactory furnace coke from Pittsburgh vein of coal carrying 34 per cent. volatile matter, assuming the coke was to be used in a furnace originally designed to produce at least 500 tons a day from Old Basin Connellsville or a good Klondike coke.

E. A. Moore<sup>10</sup>: I would say no; Pittsburgh vein coal 34 per cent. volatile will not make a suitable blast furnace coke for a 500-ton furnace.

The Author: As far as our experience goes I would answer that the same way. But lately experiments indicate that high heats and short coking time are going to enlarge the possibilities of the by-product ovens very decidedly. We find that shortening the coking time improves the coke for blast furnace use, and we expect within the next few weeks to make some experiments on Pittsburgh coal with short coking time. As far as we know up to date we would not say absolutely that you can use Pittsburgh coal to make coke for a 500-ton furnace, but we think there are possibilities being worked out.

F. C. Keighley": As my experience in the manufacture of coke has been wholly with the beehive coke oven I am not in a position to discuss Mr. Hartman's paper in detail, and what I have to say will be along general lines only.

The installation of the by-product oven in my judgment is almost wholly a question of time, place and condition. The action of the United States Steel Corporation in equipping the Gary, Ind., plant with by-product ovens is not at all surprising, as it is in keeping with their progressive methods. Few people engaged in the manufacture of pig iron or coke are at this time so fortunately situated as the Steel Corporation is with relation to their Gary improvements; however, this does not necessarily condemn the by-product system or method of coking. There are many coke plants in various parts of the country equipped with beehive ovens alone, and to install by-

<sup>\*</sup>Chief Chemist, Gulick-Henderson Company, Pittsburgh.

\*President Pittsburgh Crucible Steel Company, Pittsburgh.

\*President American Coke & Gas Construction Company, Camden,
J.

<sup>&</sup>quot;General superintendent of mines, Oliver, Pa.

product ovens would involve the loss of the whole investment. Many of these plants have but a limited supply of coal and the time element is so short that they would not be warranted in putting in the expensive by-product ovens; in other words, the coal tonnage would not be sufficient to bear the additional expense caused by the loss of the first investment and the enormous sum required for the second installation.

Many of these plants are so located that no use could be made of the surplus gas acquired through the byproduct process, and it is my understanding that this surplus gas is one of the principal sources of saving to be attained through the by-product process. The other byproducts, such as tar and ammonia, are wholly foreign to the coke manufacturer's training and many would hesitate to put money into a business that they did not understand; but I have no doubt that the by-product oven in the future will make rapid inroads on beehive coke manufacture where location and conditions are favorable.

#### COST OF BY-PRODUCT AND BEEHIVE OVENS

Mr. Hartman puts the cost of a beehive oven at from \$700 to \$800, and the cost of a by-product oven at \$12,000. These figures are a little too high for the beehive oven; however, that would cut no figure when compared with \$12,000 for the by-product oven. In order to eliminate as many figures as possible, for the sake of argument I will put the cost of a beehive oven at \$600 for comparison with the \$12,000. This would mean an investment for coke ovens alone of 20 times the cost of the beehive oven, and if my understanding of the matter is correct the investment for coke ovens is not by any means the entire outlay in connection with the by-product process.

Mr. Hartman states that recent improvements in byproduct coke ovens have made it possible to produce 10
tons of coke per oven in 16 hours, as against 4 tons of
coke produced in the beehive oven in 48 hours. Mr.
Hartman has put the product of the beehive oven somewhat low, as today this will run 5 tons or more. However, taking Mr. Hartman's figures, the output of the byproduct oven is but 7½ times that of the beehive oven,
while the investment is 20 times as great.

Mr. Hartman makes an additional claim of 5 to 10 per cent. increase in the yield of coke from coal due to the by-product system. I am unable to state exactly the average yield of coke from coal in a beehive oven, but it probably runs from 64 to 66 per cent. With an experimental beehive oven I succeeded in getting 70 per cent. of coke from the coal charged in the oven, but this was under unusual circumstances. In all probability there is an increased yield of at least 5 per cent. to the credit of the by-product method but I have doubts as to its producing and yielding capacity keeping pace with the very great cost of installation. It is possible to coke inferior coals in by-product ovens which could not be treated profitably in beehive ovens; however, the time has not yet arrived in this country when coke manufacturers have to resort to the employment of inferior coal for coking purposes.

As to the mixing of coals in the by-product oven affording certain advantages, probably the same practice would apply to the beehive product. In the matter of crushing the coal, which I understand is necessary for successful by-product production, great benefit would accrue to the beehive product by the use of the coal crusher. In the matter of breaking and sizing coke for furnace use, no particular credit is due to by-product coke, as I know of a blast furnace company that has broken and sized its beehive coke for years.

#### DATA NEEDED ON MAINTENANCE COST

Mr. Hartman gives no figures for the cost of maintenance, but is of the opinion that it is not excessive. This, of course, is open to question, and the superiority of the by-product over the beehive oven method cannot be satisfactorily demonstrated without exact figures. I do not wish to intimate that the expense of maintenance would be greater in the by-product system than Mr. Hartman indicates, but if a person were contemplating a change from beehive to by-product practice he would want figures in connection with the cost of installation, operation and maintenance that were convincing. No doubt the Steel Corporation will, within the next few

years, have figures on the cost of operation and maintenance that will be reliable and truly indicative of what can be done.

I have always understood that the principal objection to by-product coke was the excessive moisture it carried. If this highly objectionable surplus moisture has been eliminated as Mr. Hartman states, and the structure and strength of such coke is good, then it would seem that modern by-product coke possesses all the qualities of beehive coke. If this is the case, then the question of the advisability of replacing beehive with by-product ovens would hinge solely upon the ability of the coke manufacturers to acquire the large amount of capital required, the location adapted for the profitable disposition of the coke and its by-products, and a coal field of such magnitude, location and quality that would cover the requirements of the proposition. That is a combination very difficult to find.

I wish to be fair in this matter and say that since I have heard the discussion this evening my angle of vision has changed somewhat. I now believe that the building of by-product ovens will proceed with great dispatch, not so much from a coke standpoint as for the great demand there is likely to be for the by-products.

#### SILICA BRICK USED FOR BEEHIVE OVENS

As to silica brick, I believe the beehive men were in the silica brick field as early as the by-product men. occurs to me that we used silica brick 20 years ago in coke ovens. I think Mr. O. W. Kennedy, of the Frick Coke Company, bought the first carload of silica coke oven brick made in this country. They were made at Layton, Fayette County, Pa., by a man named Bradley, who everybody thought was out of his senses on the subject of silica brick. The brick he made were so soft that they crumbled to the touch. I bought the second carload, and in placing them in the ovens we lost 40 per cent. of brick through crumbfing alone. Mr. Bradley insisted that if the brick were burned hard he could not guarantee results. Later on I called the attention of a brick man right across the river from Layton, Mr. Kier, to the facts concerning silica brick. His firm made experiments and made a very firm silica brick, the breakage from it not being as great as for the ordinary coke oven brick. have been using Kier silica brick ever since that time.

### Coke Oven Gas Must Replace Natural Gas

J. W. Dougherty: Some time the natural gas at present available will become exhausted and when that actually occurs, unless some other gas is forced into the pipes now laid in the ground for the natural gas purposes, millions of dollars of property will become worthless. With natural gas selling at 30 cents a thousand cubic feet for domestic purposes, it seems to me that the gases from which the tar and sulphate of ammonia have been extracted will become also, a very valuable by-product. These gases can also be scrubbed so as to remove the hydrogen sulphide contained in them to much better advantage than can a gas made in an ordinary gas producer, so that they will be adapted to the manufacture of high grade low sulphur steels in an open hearth furnace much better than ordinary unwashed producer gas. In view of these facts, especially metallurgical standpoint, and also of the fact that we should conserve the coal in the ground for future generations, we should not throw off into the atmosphere the valuable by-products as we are doing today. Experts report that 75 to 80 lb. of ammonium sulphate per ton of coal can be recovered from Pittsburgh coals if the nitrogen contained in the coal were recovered by the addition of an ammonium sulphate plant to the gas producers supplying gas to the open hearth steel melting or the reheating furnaces.

In order to save the valuable by-products contained in our coals, I earnestly hope the Koppers people, the Otto Hofman, the Semet-Solvay or some other coke oven engineers, will soon develop an oven which will produce a satisfactory blast furnace coke from the high volatile coals. In fact all coke that is produced should be made in by-product ovens in the Pittsburgh district. May I ask Mr. Moore what we are going to do in the Pittsburgh district when the natural gas becomes exhausted?

MR. Moore: Use the by-product coke ovens.

MR. DOUGHERTY: That would be very nice indeed if

you will make satisfactory blast furnace coke from Pittsburgh coal carrying 34 per cent. volatile, but you admitted to me a short time ago you could not do it. I suppose, however, if this cannot be done with high volatile coals, some low volatile coal can be shipped into the Pittsburgh district so as to give a mixture containing 25 to 28 per cent. volatile matter from which good furnace coke can be pro-The high price which the gas brings for domestic purposes will permit of an extra price for the low volatile coal which will necessarily require a higher freight rate than coal mined in the Pittsburgh district. I might also say that the calorific value of 1000 cu. ft. of coke oven gas with hydrogen sulphide removed will be rated materially higher for metallurgical purposes than it is at present.

MR. MOORE: A peculiarity of some of the Pittsburgh high volatile coal is that no matter what the heat treatment is it does not produce a strong structure when It is much like the so-called Ronco coal treated by itself. that has been spoken of, or some of the Klondike coal; it will not produce a suitable structure under any method of heat treatment that we have discovered. It volatilizes so rapidly that it expands and makes a cellular structure so large, and the walls are so weak that when it is put into the furnace the coke is so fragile it breaks down and makes it very difficult to operate in driving the blast. That is the principal manufacturing feature, aside from the usual high sulphur content. As a matter of fact we know now from the results we have obtained in the past four or five months, from our friends putting in the Bethlehem plant, with the use of that kind of coal, such as Ronco and Klondike, and mixing it with other kinds of coal, that we can produce the right kind of coke for any blast furnace requirements so far as structure is concerned. has to be tried to find out what heat treatment it will stand. In Indianapolis we did not get good results from Kentucky coal by itself. We procured in West Virginia 34 per cent. volatile coal, but in using it we found immediately we would have to change the heat conditions. In forty-eight hours from that time we produced coke as favorable in structure in comparison with Connellsville coke as anything could be. And from that day a large trade has been developed in strictly high grade foundry coke. At times the company has been 150 cars behind in their orders. It is especially suitable for the foundries making light iron castings requiring low sulphur. They guarantee the sulphur to be 0.6 and under, and 34 to 1 per cent. moisture.

#### Lectures on the Smoke Problem

The Department of Industrial Research, University of Pittsburgh, Pittsburgh, Pa., announces that members of its staff have prepared a series of lectures on the smoke problem which will be delivered wherever desired. subjects of these lectures are as follows: 1. The Smoke Nuisance (A general presentation of the main phases of the subject); 2, Smoke and the Public Health; 3, Smoke and the Cost of Living; 4, Smoke and Plant Life; 5, Methods and Means of Smoke Abatement; 6. The Effect of Smoke on Buildings and Building Materials; 7. The Psychology of Smoke; 8, The Smoke Nuisance and the Housekeeper.

An investigation is being conducted with funds supplied by a Pittsburgh business man, by a staff of 25 specialists, of whom seven are giving their entire attention to this task. Some are studying the effect of smoke and soot on the atmosphere, the weather, plant life, buildings and public health; some are investigating the economic damage done; others are making a detailed study of the mechanical devices for preventing or abating smoke, and still others are inquiring into the chemistry and physics of smoke and soot, into the laws concerning the smoke nuisance and into the history of the subject as a whole. Further particulars will be made known on application to Dr. Benner, Department of Industrial Research, University of Pittsburgh.

The Alabama Consolidated Coal & Iron Company, Birmingham, Ala., is distributing a document clip made of brass, enameled in red and black, advertising its Clifton and Etowah brands of pig iron.

# Growing Importance of Oil as a Power Fuel

An interesting analysis of refined petroleum products from the standpoint of their uses for power was contained in a paper on "Oil" by J. H. Adams read before the National Gas Engine Association in Milwaukee, June 20. Crude petroleum, after refining, may be grouped, roughly, into five families, two of which comprise more than twothirds of the whole. These two are kerosene and fuel oil, each amounting to approximately one-third of the total supply of crude oil, the three small families each amounting to a little less than one-eighth of the total supply: first, the naphtha family; second, lubricating oils; third, paraffine, asphalt and residuum.

The naphtha family is of chief importance, comprising oline, benzine and naphtha. Probably not over one-third of the oils classed in the naphtha family, or less than 5 per cent. of the total oil production of the country, is gasoline

Of the second or fuel oil family, one-third to one-half is now consumed by the railroads in their oil-burning locomotives, and a large percentage of the remainder is used in heating operations, for which this oil is peculiarly well There remains then for power the remainder of the fuel oil family, nearly the whole of the kerosene family and a portion of the naphtha family.

With the increasing production of oil and the decreasing use of lamps, the kerosene used for light is becoming a small proportion of the total, and from the various sources enumerated fully one-half of our present total supply of fuel oil is available for power purposes in a properly signed internal combustion engine. It is evident, then, that for the present the kerosene and closely allied families must supply the demand for oil power which the gasoline engine has created. It is further evident that this demand is so great that it will control the systems of refining and of distribution, and that in the near future a new family will spring up, combining kerosene and portions of these other families, which combination may be known as the power family. This will be the power oil of the immediate future.

The great refiners of this country realize this state of affairs and are preparing to meet it. They look forward to a day in the immediate future when a half or more than a half of the oil supply of the country will be marketed for one purpose and under one trade name, and when power oil in tins or in tanks will be available in every hamlet, distributed in bulk to a myriad of distribution centers and sold at a low cost.

#### Multistage Centrifugal Air Compressors for Blast Furnaces

Within the last month the General Electric Company, Schenectady, N. Y., has received orders as follows multistage centrifugal air compressors for service as blast furnace blowers:

One 25,000 cu. ft. per min., 15 to 25 lb. pressure comressor, driven by a high pressure steam turbine, from the E. & G. Brooke Iron Company, Birdsboro, Pa.; one 13,000 cu. ft. per min., 16 to 25 lb. pressure compressor, driven by a mixed pressure turbine, from the Chattanooga Coal & Iron Company, Chattanooga, Tenn.; three 40,000 cu, ft. per min., 15 to 30 lb. pressure compressers, driven by high pressure steam turbines, from the Woodward Iron Com-

pany, Woodward, Ala.

The General Electric Company has six multistage air compressors already installed as blast furnace blowers. It enumerates the principal advantages of this type of compressor as follows: Great saving of floor space, great saving in net weight, large saving in oil supplies and maintenance, and excellent control of required volume of air against whatever pressure may be required in the operation of the blast furnace. This close control of air is accomplished by a constant volume governor, which is one of the unique features of these blowing engines.

Canada's imports of iron and steel from the United States for the fiscal year ended March 31, 1912, totaled \$36,382,725, as against \$29,307,039 for the previous year. The total does not include machinery, agricultural implements nor many other articles properly classified as iron and steel. The figures in hand at the Government departand steel. ments at Ottawa show a steady increase since March

# THE IRON AGE

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#### The Status of Car Building

Conditions in the car building industry do not seem to be generally understood. Comment is made in some quarters upon the apparent discrepancy between reports, some reports implying that the car building industry is in a highly prosperous condition, while others indicate that the shops are operating at far less than their capacity, with few orders in sight.

The apparent discrepancy between these reports is due in large part to misuse of the terms employed, actual physical or market conditions being interpreted into general terms which do not precisely fit the conditions obtaining. The car shops have booked a certain amount of business in the past eight months, a very large amount in contrast with the dearth of orders for more than a twelvemonth preceding, and these orders have been booked chiefly at very low prices, With these orders the shops have reached a rate of operation at not far in either direction from 60 per cent. of their full normal capacity. At the same time the plate mills of the country have become practically filled with business, having early acquired sufficient backlog business to make them entirely indifferent to further orders at prices approaching those at which the backlog business was taken. The car shops purpose obtaining materially higher prices upon further car orders, the early orders having been taken at practically profitless rates. At the same time there is in many districts the most acute labor scarcity that has been seen in years.

From the conditions thus briefly outlined there has sprung a situation which very naturally involves apparent inconsistencies. The plate mills are operating practically full, while the car shops are not. The demand for plates other than for car making has probably increased much more rapidly in the past half dozen years than has the demand for car plates, a fact which tends to confuse those who attempt to judge the car industry at one time by the inquiries for car plates and at another time by the rate of operation of the car builders, for recently car builders not fully employed placed inquiries before some of the smaller plate mills which do not usually cater to that trade.

Apparent discrepancies exist in statements as to car requirements, which discrepancies are due in large part to confusing requirements or desires with actual inquiries. Many of the railroads would like to have a large additional number of cars, but they would like to have them before the crop moving season reaches its height. They see the probability of a shortage at that time. At the same time they are economical and do not wish to pay much more for cars than the prices which prevailed in the winter. The car shops, however, are not in position to meet these views. It is difficult and expensive for them to increase further their working forces, which would be necessary in order to meet the views of railroads as to deliveries. Again, fresh in their minds is the experience of extremely slack operations for a long period of months, and realizing that every car built now means one less for the future they prefer to add a reasonable profit upon additional cars to be built in the near future, giving the roads the option of taking them now at such prices or of waiting until perhaps they may become more anxious for orders. Finally, to buy plates for additional cars to be built in the next few months, when the plate mills are already in very comfortable position, would involve much higher prices. Here are three items involving higher costs for additional cars

to be built in the next few months. The railroads know the car market and know approximately what they would have to pay. Hence the apparent discrepancy of railroad requirements, or desires, in a general sense, being large, while the actual inquiries in the market are small.

The present condition as to car building is that, as already observed, the car shops are operating at not far from 60 per cent. of their capacity, which means a much smaller daily outturn than the average of 1906 and 1907, when as a rule the shops were operating at a forced speed, and of course represents a much lower percentage of capacity engaged than in 1906-7. There are great differences in the operations at different car plants, since last winter some of the shops were much more aggressive than others in taking orders at low prices, which also has a tendency to confuse judgment as to the rate at which the industry as a whole is operating.

As to the quantity of freight car business on the books of the car shops, fairly adequate information is available. There are unfilled orders on books for between 75,000 and 100,000 freight cars. The car shops entered the year with orders for somewhat more than 75,000 cars on books, and have produced about as many in the half year. All-steel and steel underframed cars are practically the only lines to be considered nowadays, and it is possible that the shop capacity is frequently over-rated. The maximum number of freight cars built in a year, according to the reports made to the Railway Age Gazette, whose figures of production are usually accepted as indicative of actual conditions, was 284,188 in 1907. At that time some wooden cars were still being made, and a considerable number of the cars were of smaller capacity than would now be bought, so that it is improbable that the full capacity of the shops operated without forcing upon the types of cars which are now purchased can be considered equal to the number of cars of the various descriptions actually built in 1907.

The only records, covering a period of years, of car orders placed are those of the journal just quoted, and on account of occasional cancellations and other incidents they are presumably not as accurate as are the figures of cars actually built. In fact, the annual compilations as published show, in the 11 years 1901 to 1911 inclusive, a total of 1,610,397 freight cars built and a total of 1,963,871 cars ordered. The reports therefore are that 337,244, or 21 per cent., more cars were ordered than were built, and the carry over from 1911 into 1912 cannot account for the discrepancies, since it cannot have been materially larger than that from 1900 to 1901. The figures of the Railway Age Gazette for the 11 years are given below, and for comparative purposes it may be mentioned that the recent movement has been approximately as follows: 50,000 cars ordered in the first six months of 1911, 20,000 in the next four months, 60,000 in November and December and 75,000 in the first six months of this year, making 135,000 cars in the past eight months, against. 70,000 in the preceding 10 months. All the figures refer to freight cars exclusively.

	Ordered.	Built.		Ordered.	Built.
1901	193,439	136,950	1907	151,711	284,188
1902	195,248	162,599	1908	62,669	76,555
1903	108,936	153,195	1909	189,360	93,570
1904	136,561	60,806	11910	141,204	11180,945
1905	341,315	165,155	1911	133,117	72,161
1906	310.315	240 503			

From 1905 the figures include Canada and Mexico.

Of the cars built last year 52,592, or 73 per cent., are referred to as all-steel or steel underframe, while of the 133,117 cars ordered last year 50,094 were all-steel, 54,605 were steel underframe and 28,418 were wood.

## Summer Demands on the Trade School

A significant commentary on the usefulness of trade schools is found in the eagerness with which boys seek entrance to the summer courses. The State Trade School at Bridgeport, Conn., has been compelled to divide the summer into periods in order that all the boys who are registered for the machinist's course may be accommodated. The full quota of 20 is at work, and 40 others will have their turns later in the vacation. The drafting department is also full, with 40 students, and has a growing waiting list.

This thriving institution is typical of cities and towns in which are schools of this class, that continue their work through the summer. It is a good sign that so many of the younger generation have the ambition to give up a large portion of the summer holidays to so useful a training. Such boys have stuff in them; they will be valuable recruits to the ranks of skilled mechanics, and many of them, later on, to the administrative forces of works in which the machine shop and drafting room are important factors. The movement for starting boys wisely in mechanical pursuits is making headway, and the ultimate influence in the trade will be tremendous. The summer school is a very important adjunct of the system. A normally strong and healthy boy can devote a portion of his summer rest from the class room to a school in which a large part of the training is carried on in a wellventilated shop room, with little fear of injury to his constitution.

### Co-operation in Credits

At the convention of the credit men of the United States, recently held at Boston, it was urged that a bureau national in scope be created for the interchange of credit information. Certainly any co-operation pertaining to credits must bring with it beneficial results, and these will be proportional to the degree of organization. Little attention has been given the question, excepting in a very general way, by the associations of manufacturers and of dealers in machinery and other metal products. Still it seems a proper feature of association work. Business houses manufacturing or handling the same general lines of goods have a common enemy in the firm which seeks to buy beyond its resources and cares little for broken promises. Credit extended in such a case means slow pay and oftentimes eventual loss. An interchange of experiences of this character must work to the common good of any class of business men, buyers as well as sellers. Legally the assistance thus given is permitted under the class of privileged communication. In some communities competing business houses exchange information of this character without hesitation; the custom is well established and the work thus done is highly important. In other places relations are less intimate, perhaps more antagonistic, and undesirable customers profit by this condition.

Credits are watched more closely than before the days of credit men's conventions, but the bars are yet far too often let down to the plunger or the dishonest man. A national bureau may be a dream

beyond hope of realization in this generation, but no suggestion that will stimulate better co-operation for the elimination of poor accounts should be passed without a serious effort to give it practical effect.

# Soliciting Other Employers' Workmen

Advertisements for skilled mechanics are appearing with increasing frequency in the daily newspapers, usually in cities other than those of the manufacturers who are attempting to recruit their working forces. First-class machinists are hard to get, and shop owners are not to be blamed for going after them. Only, the attempt often develops a boomerang effect. The condition created is much like that which has resulted from a similar cause in some iron and steel centers, as referred to in our market summary of June 20. An advance in wages is established which in a sense is wholly artificial.

When the manufacturers in a city or in different cities, employing the same class of labor, make deliberate effort to secure men one from the other, the exchange may be fair enough, but it carries with it an increased cost and a certain amount of general disorganization. Changing help means disturbance in the routine of a plant. Where works are isolated, either in a small community or in a larger city where other classes of industry predominate, it is sometimes necessary to resort to advertising in centers where the desired labor exists in large supply. Employers' labor bureaus are useful in curbing the practice, both locally and in groups of cities which have bureaus acting in co-operation. It has been noticed repeatedly that where advertisements soliciting labor for one city appear in the newspapers of another, counter-advertising quickly follows, and the game thus very soon becomes an expensive one, oftentimes more so than to attempt to get along with an insufficient force.

#### The Iron Age Index

The Index to Volume 89 of *The Iron Age*, January I to June 30, 1912, has been compiled and printed and will be mailed to subscribers applying for it. A list of those who have received the Index heretofore is kept in this office, and to all such a copy of the one just completed will be mailed without notice from them. Additional names will be put upon this list on request.

### New Publications

Gemeinfassliche Darstellung des Eisenhütten Wesens. 8th Edition. 8vo. xrr + 404 pages; 63 Illustrations. 8th Edition. 8vo. XII + 404 pages; 63 Illustrations. Price, bound in linen, 5 Marks. Published in Duesseldorf by Stahleisen M. B. H.

This is the eighth edition of this popular setting forth of the iron and steel industry from the German standpoint, which has been thoroughly revised, enlarged and brought up to date by Dr. E. Schrödter of the Verein Deutscher Eisenhüttenleute. The first edition, which appeared in 1889, was founded on a series of special articles published in 1880 in the well-known Cologne Gazette. It

speedily ran out of print.

The book is divided into technical and economic sections of 179 and 225 pages, respectively. The technical section consists of an introduction, three chapters and an appendix. The introduction has a new sub-division on the properties of iron and steel, and concludes with a clearly written and interesting historical sub-division of 10 pages. The first chapter very properly takes up the production of pig iron, the sub-divisions being the raw material, bituminous coal and coke, the blast furnace and the products of the blast furnace. The latter include the pig iron, the slag

and the waste gases and the way each is worked up, but flue dust is not mentioned. Many excellent photographs taken at various German coke ovens and furnace plants illustrate the various sub-divisions. The subject of the second chapter is the production of "Schmiedbares Eisen," by which is meant metal with less than 2 per cent. carbon, which is forgeable and less brittle than pig iron at ordinary temperatures. The sub-divisions are the hearth fire, puddling, the acid and basic Bessemer, the open hearth process, the production of blister, shear and crucible steel, and electric iron and steel production.

The third chapter is concerned with the work of shaping the metal, and the first sub-division, which covers 29 pages, is on the iron and steel foundry. Then follow forging, pressing and rolling, the whole being illustrated with some very good photographs. The last sub-division is on the protection of the surface from corrosion. The appendix, which is rather short, takes up the methods of testing iron and steel, including metallography. This whole technical section is very clearly and simply written, and the book would be excellent for students in metallurgy desirous of enlarging their German vocabulary.

The second part of the book gives statistics and information of all the iron and steel producing countries and has some interesting sub-divisions on economic subjects, such as labor conditions, tariffs, and the future of the iron and steel industry. The last 71 pages contain classified lists of the blast furnace plants, different kinds of mills and foundries in Germany and Luxemburg.

G. B. W.

Metallurgy of Cast Iron.—By Thomas D. West. Fourteenth edition. xxvi + 537 pages, 434 x 71/4 in. Published by the Penton Publishing Company, Cleveland. Price \$3.

In his preface to this fourteenth edition, Mr. West says that it has been revised to a greater extent than any of the editions since the third. The general statement is made that information has been added and a few minor corrections and changes made that will increase the value of the work. The author had hoped to omit much of the matter opposing the practice of judging the grade of pig iron by its fracture, but adds that as there is still some adherence to this "erroneous practice" he has thought it advisable to retain the pages advocating chemical analysis.

# Northern Furnace Companies and Freight Rates on Southern Pig Iron

An important meeting of Northern pig iron producers was held in Cleveland, July 6, to consider what action should be taken on the application in behalf of Southern furnace interests, filed with the Interstate Commerce Commission, asking for a considerable reduction in rates on pig iron. The Cleveland meeting was attended by a fair representation of Northern producers. It is stated that the pig iron meeting was an informal one and that no committees were appointed and no definite action of any kind was taken. However, the matter was discussed at considerable length. The sentiment was said to be unanimous against the application of the Southern producers and it is expected that when the matter comes up for hearing before the Interstate Commerce Commission the Northern producers will be represented and vigorously oppose any lowering of the Southern rates. Northern furnace men say that if rates on Southern iron are reduced they will ask for an entire re-adjustment of Northern rates. This means that Northern furnacemen would ask for lower freight rates on iron ore, pig iron, coal and coke.

#### Allis-Chalmers Reorganization Troubles

The Allis-Chalmers Reorganization Committée, says the Wall Street Journal, will apparently have a somewhat difficult row to hoe before it succeeds in getting possession of the property at foreclosure sale. As a result largely of the suit filed in the interest of Nathan Eisemann, of Boston, foreclosure sale which was to have occurred within a week or two has been postponed until September 11. Further than that, Receiver Call, who is also president of the corporation, has been removed, leaving Receiver Otto H. Falk in charge. The Eisemann interests are not alone, however, in opposing the foreclosure. Independent pro-

ceedings by stock and bond holders under the leadership of P. Chalmers are also in progress, and it is intimated that when certain statements which the Chalmers people have prepared are filed some highly sensational assertions will be discovered. The fundamental claim is that the Allis-Chalmers Company was never really in default of interest on its bonds and has no right to be treated as a bankrupt corporation.

#### Amalgamated Scale Signers

The companies named below have signed the puddling and finishing scales of the Amalgamated Association for the year beginning July 1, 1912:

American Car & Foundry Company, Detroit, Mich. Empire Rolling Mill Company, Cleveland, Ohio.

Ft. Wayne Rolling Mill Company, Ft. Wayne, Ind. Highland Iron & Steel Company, Terre Haute, Ind., and Blue

Interstate Iron & Steel Company, East Chicago, Ind. Helmbacher Forge & Rolling Mill Company, St. Louis, Mo., and

Madison, Ill. dison, III.

Kansas City Bolt & Nut Company, Kansas City, Mo.

Lake Erie Iron Company, Cleveland, Ohio.

National Rolling Mill Company, Vincennes, Ind. Ohio Falls Iron Company, New Albany, Ind. Railway Steel Spring Company, Detroit, Mich. Union Rolling Mill Company, Cleveland, Ohio.

Republic Iron & Steel Company, for the Mahoning Valley Works. Youngstown, Ohio; Brown-Bonnell Works, Youngstown; Inland East Chicago, Ind.; Tudor Works, East St. Louis, Ill.; Sylorks, Moline, Ill.; Toledo Works, Toledo, Ohio; Gate City Works, Moline, Works, Gate City, Ala.

The signers of the sheet and tin plate scales of the Amalgamated Association are as follows:

American Rolling Mills Company, Middletown, Ohio. Follansbee Brothers Company, Follansbee, W. Va. Newport Rolling Mill Company, Newport, Ky. Whitaker-Glessner Company (two mills), Wheeling, W. Va., and

Martins Ferry, Ohio.

Pope Tin Plate Company, Steubenville, Ohio.

Carnahan Tin Plate Company, Canton, Ohio.

Brier Hill Steel Company (Thomas and Empire mills), Niles,

De Forest Sheet & Tin Plate Company, Niles, Ohio.

N. & G. Taylor Company, Cumberland, Md.

National Enameling & Stamping Company, St. Louis, Mo., and Granite City, Ill.

Youngstown Iron & Steel Company, Youngstown, Ohio.

#### Coke Production in 1911

The production of coke in the United States in 1911 was less than that of 1910 and below the average for the last six or seven years, according to a statement by Edward W. Parker just issued by the United States Geological Survey; but a striking and encouraging feature of the condition of the industry was an increase in the amount of coke made in by-product ovens and the incidental conservation of the gas and coal-tar products otherwise wasted. In sympathy with the depression in the iron trade, the total production of coke decreased 15 per cent. in 1911, compared with 1910, but the output from the by-product ovens increased 10 per cent., and the increase in the number of ovens of this type in operation was larger than in any other year, with one exception, since they were introduced into the United States.

The total production of coke in 1911 was 35,555,362 net tons, valued at \$84,103,571, compared with 41,708,810 tons, valued at \$99,742,701, in 1910. The 1911 output consisted of 27,705,517 tons of beehive coke, with an average value of \$2.05 a ton, and 7,847,845 tons of by-product coke, with an average value of \$3.48 a ton. The difference in price was due largely to the fact that most of the by-product plants are situated nearer to the markets for coke, as well as for gas and other by-products, so that the transportation charges are added to the cost of the coal instead of to that of the manufactured coke.

The beehive ovens produced an average of 466 tons each; the by-product ovens an average of 1,817 tons each. At the close of 1911 there were 2.254 ovens in course of construction, of which 698 were of the by-product type.

The following table shows the total production of coke in the United States in the last five years; it also shows

the increase in the production of by-product coke in those

Year.	By-Product Oven Coke (Net Tons).	Total (Net Tons).
1907	5,607,899	40,779,564
1909	4,201,226	26,035,518 39,315,065
1910	7.138,734	41,708,810
1911	7,847,845	35.555,362

# The Senate Favors Two Battleships

The Senate July 5 passed the Naval Appropriation bill for \$133,609,674, after a long tussle that ended in adding to the bill a provision for two battleships. Fourteen crats joined with 30 Republicans in favor of it, while only eight Democrats and four Republicans voted to keep the navy down to the standard fixed by the House. It is not impossible that the Senate conferees, when the bill goes to conference, may succeed in getting both battleships re-tained in the final measure, while the retention of one of them is a certainty. With the single exception of Mr. Painter, of Kentucky, the Democrats who voted for the two battleships were either from the coastwise States or from States interested, like West Virginia, in the mining of coal and iron. An amendment was adopted making the recently enacted eight-hour law applicable to work on new ships, though Senators Gallinger and Heyburn contended it would increase the Government expense by \$4,000,000 or \$5,000,000.

New Use for Indicator Cards.—"A New Analysis of the Cylinder Performance of Reciprocating Engines," by J. Paul Clayton, has just been issued as Bulletin No. 58 of the Engineering Experiment Station of the University of Illinois. It contains the results of an extensive investigation of indicator diagrams from engines using steam, gas, air and ammonia. It has been found that the actual steam consumption of an engine may be computed by a new method from the indicator diagram alone to within 4 per cent. of the results obtained by tests. New methods have also been devised for detecting leakage from the indicator card, for computing the amount of the clearance volume, and for closely locating the cyclic events. Copies of the Bulletin No. 58 may be obtained upon application to W. F. M. Goss, director of the Engineering Experiment Station, University of Illinois, Urbana, Ill. The bulletin, it is understood, is an extension of the paper presented by Mr. Clayton before the American Society of Mechanical Engi-

Data on Boiler Tubes .- The National Tube Company, Frick building, Pittsburgh, has sent out an unusual booklet of 40 pages, printed on heavily coated paper and entitled "The Modern Boiler Tube." It contains a story of the evolution and development of the boiler tube, some expert opinions on its efficiency, and illustrations of standard mill physical tests of Spellerized tubes. By question and answer the facts are given concerning the manufacture and service of this type of tubes. Tables of specifications are given for lap welded and seamless steel boiler tubes for merchant and marine service. The booklet also contains a large amount of information on the merits of steel and iron tubes, with a summary of the discussions at the conventions of the International Master Boiler Makers' Associations held in 1909, 1910 and 1911.

Iron and Steel Institute's Autumn Meeting .- The Iron and Steel Institute (London) announces through its secretary, G. C. Lloyd, that the autumn meeting will be held at Leeds, England, from Monday to Friday, September 30 to October 4. The formal opening will occur on the morning of October 1, when a welcome will be given by the Lord Mayor of Leeds in the Hall of the Philosophical and Literary Society, after which a selection of papers will be read and discussed. The final business papers will be read and discussed. The final business meeting occurs on the morning of October 3. October 4 is set aside for a visit to be made to North Lincolnshire. October 4

The New York Shipbuilding Company, Camden, N. launched successfully on July 3 the steamship Rayo, being built for the Standard Oil Company. The vessel is 343 ft. long, 46 ft. beam, and has a capacity of 1,250,000 gal. of

# The Iron and Metal Markets

# July Business Light

# Increase in Steel Corporation Orders Last Month

#### Advances in Hoops and Blue Annealed Sheets— A Scotch Shipyard Wants 50,000 Tons of American Plates

The first 10 days of the second half of the year have borne out the general expectation of a marked shrinkage in iron and steel orders in July and August. Many consumers of steel products having entered definite specifications for all the low priced material taken at prices \$1 to \$3 a ton below the present level will have only a casual interest in the market for several months.

The Steel Corporation's statement of unfilled orders at the end of June, given out July 10, shows 5,807,346 tons, against 5,750,983 tons on May 31, an increase of 56,363 tons. It should be borne in mind that the very heavy specifications in June could not affect this statement, which deals with new business as represented by contracts entered into in that month. The increase is unexpected and the total is the largest since that at the close of 1909, which was 5,927,031 tons.

The failure of the market for steel making pig iron in the Central West to reflect the advances in finished steel products and the smaller ones in steel billets and sheet bars is a matter of some comment. In fact, the whole pig iron situation in that district and in the farther western lake region must be judged in the light of the large capacity of modern furnaces now idle at lake cities—three in the Buffalo district, one at Cleveland, one at Toledo, three at Chicago and two in the Milwaukee district.

The high price asked for coke has no doubt held back furnaces that are ready to blow in. But the coke situation is now working easier. In the past week contract coke for the second half of the year has sold at \$2.25 and there is freer offering on that basis. The fact that so many furnaces have entered the third quarter without contracting, leaving some coke producers without either contract or prompt orders for July, has caused some weakening in the price.

Foundry iron markets present some cross-currents. Eastern producers have been able to establish an advance and Southern furnaces have realized higher prices for certain irons wanted for usual mixtures, as high as \$12 being done, but the Middle Western furnaces are still making prices that have delayed the disappearance of low priced Tennessee iron in closely competitive territory.

In semi-finished steel it is noteworthy that the wants of sheet and tin plate mills are better taken care of and that no premiums are offered for prompt delivery of sheet bars, though there was little of this at any time. A further sale is reported of 5000 tons of rolling billets from an Eastern mill for shipment to the Central West. Export shipments of billets and sheet bars have been large.

Intimations of still higher prices for the heavier forms of finished materials are not well founded. Two minor advances in other lines have been made in the past week, however—\$1 a ton on blue annealed sheets,

making 1.30c., Pittsburgh, the minimum for No. 8 and heavier, and 1.40c. for No. 10, and a \$2 advance on hoops, this being effective July 10.

The wrought steel pipe trade has established the recent advance of \$2 a ton on 7-in. pipe and larger, following the early June advance in smaller sizes. In iron pipe also a general advance of \$2 has been effected.

A feature of the export steel trade is the larger participation of independent steel companies. An interesting negotiation is for 50,000 tons of plates between one of these companies and a large Scotch shipyard.

With more certainty than at any time in months can reference be made to the establishment of higher prices for fabricated steel. A number of the larger companies have orders that will carry them into 1913. A factor yet to be measured is the effect of more costly steel work upon the flow of capital into new construction.

The spectacular drop in the London copper warrant market this week, with some unsettling there also of the market for the metal, is not surprising. Well timed was the appearance of stories of large hidden stocks of refined copper, which yet seemed to be not so successfully hidden as to prevent knowing ones from telling in print their amount. The domestic market for copper has been nearly at a standstill for several weeks, and it would be hard to say to-day at what figure a large transaction could be put through. Some selling interests announce that their price is the same as two weeks ago, but as the speculative advance aided in rapidly pushing up the price of copper it is not likely that the speculative decline will be without its effect on the market for the metal. Those who feared the effect of the rapid rise should not be unwilling to see it interrupted.

# A Comparison of Prices

#### Advances Over the Previous Week in Heavy Type, Declines in Italies.

At date, one week, one month and one year previous.

the duted one meent one mon	orn Barre o	300	. proces	
				July 12,
Pig Iron, Per Gross Ton:	1912.	1912.	1912.	1911.
Foundry No. 2, standard, Phila-				
delphia	15.75	\$15.50	\$15.25	\$15.00
Foundry No. 2, Valley furnace	13.25	13.25	13.25	13.50
Foundry No. 2, Southern, Cin-				
cinnati	14.75	14.50	14.25	
Foundry No. 2, Birmingham, Ala. Foundry No. 2, at furnace,	11.50	11.25	11.00	10.00
Chicago	14.50	14.50	14.50	15.00
Basic, delivered, eastern Pa	15.50	15.50	15.25	14.25
Basic, Valley furnace		13.25	13.00	13.25
Bessemer, Pittsburgh		15.15	15.15	15.90
Malleable Bessemer, Chicago	14.50	14.50		15.00
Grav forge, Pittsburgh		13.90	13.90	13.90
Lake Superior charcoal, Chicago	16.25	16.25	16.25	16.50
Billets, etc., Per Gross Ton:				. 1/.
Bessemer billets, Pittsburgh	21.50	21.50	20.50	21.00
Open hearth billets, Pittsburgh.		21.50	20.50	21.00
Forging billets, Pittsburgh	28.00	28.00	28.00	26.00
Open hearth billets, Philadelphia	24.40	24.40	23.40	23:40
Wire rods, Pittsburgh	25.00	25.00	25.00	27.00
Old Material, Per Gross Ton:				
Iron rails, Chicago	16.00	16.00	16.00	14.00
Iron rails, Philadelphia	16.50	16.50	16.50	16.75
Car wheels, Chicago	14.00	14.00	14.25	12.50
Car, wheels, Philadelphia	14.00	14.00	13.50	12.75
Heavy steel scrap, Pittsburgh	13.50	13.50	13.50	13.00
Heavy steel scrap, Chicago	11.50		12.00	10.50
Heavy steel scrap, Philadelphia	13.50	13.50	13.50	13.90

<sup>\*</sup>The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Finished Iron and Steel.  Per Pound to Largest Buyers: Bessemer rails, heavy, at mill.  Iron bars, Philadelphia Iron bars, Chicago Steel bars, Pittsburgh Steel bars, Pittsburgh Tank plates, Pittsburgh Tank plates, Pittsburgh Beams, Pittsburgh Beams, Pittsburgh Beams, tidewater, New York Angles, Pittsburgh Angles, Pittsburgh Angles, Pittsburgh	1912. Cents. 1.25 1.32½ 1.35 1.30 1.25 1.41 1.30 1.46 1.30	1.35 1.27 ½ 1.25 1.41 1.30 1.46 1.30 1.46 1.30	1912. Cents. 1.25 1.30 1.25 1.27 ½ 1.20 1.36 1.25 1.41 1.25 1.41 1.25	1911. Cents. 1.25 1.27½ 1.25 1.20 1.25 1.41 1.35 1.51 1.35
Angles, tidewater, New York Skelp, grooved steel, Pittsburgh. Skelp, sheared steel, Pittsburgh	1.46 1.20 1.25	1.46 1.20 1.25	1.41 1.20 1.25	1.51 1.25 1.35
Sheets, Nails and Wire, Per Pound to Largest Buyers: Sheets, black, No. 28, Pittsburgh Wire nails, Pittsburgh. Cut nails, Pittsburgh. Fence wire, ann'led, 0 to 9, Pgh. Barb wire, galv., Pittsburgh.	Cents. 1.90 1.60 1.55 1.40 1.90	Cents. 1.90 1.60 1.55 1.40 1.90	Cents. 1.90 1.60 1.55 1.40 1.90	Cents, 2.00 1.70 1.60 1.50 2.00
Coke, Connellsville,  Per Net Ton at Oven: Furnace coke, prompt shipment Furnace coke, future delivery Foundry coke, prompt shipment Foundry coke, future delivery	<b>\$2.25</b> 2.25 2.40 2.50	\$2.15 2.25 2.40 2.60	\$1.90 2.25 2.40 2.40	\$1.40 1.55 1.80 2.05
Metals, Per Pound:  Lake copper, New York Electrolytic copper, New York. Spelter, St. Louis Spelter, New York Lead, St. Louis. Lead, New York. Tin, New York. Antimony, Hallett, New York. Tin plate, 100-lb. box, New York.	4.75 44.62½ 7.75	7.00 7.15 4.40 4.50 46.00	Cents. 17.50 17.37½ 6.75 6.90 4.37½ 4.50 47.37½ 7.87½ \$3.64	4.51

# Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb., New York, 16c.; Philadelpnia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates 1/4 in thick 61/4 in the contraction.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.30c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ½ in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square ft. are considered ½-in. plates. Plates over 72 in. wide must be ordered ½ in. thick on edge, or not less than 11 lb. per square ft. to take base price. Plates over 72 in. wide ordered less than 11 lb. per square ft., down to the weight of 3-16 in. take the price of 3-16 in.

3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras. Cer	nts per l	
Gauges under 1/4 in. to and including 3-16 in. on thin-		
nest edge	.10	
Gauges under 3-16 in. to and including No. 8	.15	
Gauges under No. 8 to and including No. 9	.25	
Gauges under No. 9 to and including No. 10	.30	
Gauges under No. 10 to and including No. 12	.40	
Sketches (including all straight taper plates) 3 ft. and		
over in length	.10	
Complete circles, 3 ft. in diameter and over	.20	
Boiler and flange steel	.10	
"A. B. M. A." and ordinary firebox steel	.20	
Still bottom steel	.30	
Marine steel	.40	
Locomotive firebox steel	.50	
Widths over 100 in. up to 110 in., inclusive	.05	
Widths over 110 in. up to 115 in., inclusive	.10	
Widths over 115 in. up to 120 in., inclusive	115	
Widths over 120 in. up to 125 in., inclusive	.25	
Widths over 125 in. up to 130 in., inclusive	50	
Widths over 130 in	1.00	
Cutting to lengths or diameters under 3 ft. to 2 ft., in- clusive	.25	
Cutting to lengths or diameters under 2 ft. to 1 ft., in-		
clusive	50	
Cutting to lengths or diameters under 1 ft	1.55	

No charge for cutting rectangular plates to lengths 3 ft, and over.

Wire Rods and Wire.—Bessemer, open hearth and wire Rods and Wire.—Bessemer, open hearth and chain rods, \$25. Fence wire, Nos. o to 9, per 100 lb., terms, 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, \$1.40; galvanized, \$1.70. Galvanized barb wire, to jobbers, \$1.90; painted, \$1.60. Wire nails, to jobbers, \$1.60. The following table gives the price to retail mer-chants on wire in less than carloads, including the ex-tras Nos. 10 to 16, which are added to the base price:

Nos. 0 to	9 10	11 12 8	er 100 lb.	14	15	16
Annealed\$1.5 Galvanized 1.8	\$ \$1.60	\$1.65 \$1	1.70 \$1.80 2.00 2.10	\$1.90 2.20		\$2.10

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in., and angles, 3 to 6 in., on one or both legs, 1/4 in. and over, 1.3oc. Other shapes and sizes are quoted as follows:

	Cents per Ib.
I-beams over 15 in	1.35 to 1.40
H-beams over 18 in	
Angles over 6 in	1.35 to 1.40
Angles, 3 in. on one or both legs, less than	
1/4 in. thick, plus full extras, as per steel bar	
card Sept. 1, 1909	1.35 to 1.40
Tees, 3 in. and up	1.35 to 1.40
Zees, 3 in. and up	1.30 to 1.35
Angles, channels and tees, under 3 in. plus	4 7 1
full extras as per steel bar card Sept. 1, 1909.	1.35 to 1.40
Deck beams and bulb angles	
Hand rail tees	
Checkered, trough and corrugated floor plates	2.25 to 2.50

	Extrus	for Cutting to Length.	Cents per 1b
Under 3 ft., Under 2 ft.	to 3 ft.,	inclusive	
Under 1 ft			
No charge for	Cutting	to lengths 3 ft. and over.	

Sheets.—Makers' prices for mill shipments on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows:

#### Blue Annealed Sheets.

	1.30 to 1.35
 	1.40 to 1.45
 	1.45 to 1.50
 	1.50 to 1.55
	1.60 to 1.65

#### Bay Annealed Sheats Cold Rolled

			DON	63	1 11	PR C	Lay	16:	U	-	20	9.6	reis, com acomes	Fig.	
Nos.	13	and	14							0	0 1	0 0			
Nos.	15	and	16										1.65 to 1.70		1.75 to 1.80
													1.70 to 1.75		1.80 to 1.85
Nos.	22.	23	and	2	4.						0 1		1.75 to 1.80	7	1.85 to 1.90
															1.90 to 1.95
No.	27					0.1							1.85 to 1.90		1.95 to 2.00
No.	28										0				2.00 to 2.05
													. 1.95 to 2.00 "		2.05 to 2.10
															2.15 to 2.20

# Galvanized Sheets of Black Sheet Gauge.

Nos.	10	an	d	1	11	0.1					0	0							0	0	0			. 0	0	0					0		1.90	to	2.00
Nos.																																			
Nos.	15	an	d	1	6			0			0	0		0	0 1			۰			0	0 1			0	0					0	0	2.10	to	2.15
Nos.	17	to		21						0	4		0	0	0 1			0	0	0	0	6 1			٥	0		0 (		0	9		2.30	to	2.40
Nos.	22.	23	3	ai	rd	1	24	١.			0						, (				0	6		. 0	0		0	0 1			4		2.40	to	2.50
Nos.	25	an	d	2	26					0			0								0	0	0 4	0	0	0	0				0		2.60	to	2.70
No. 2	27						0. 4		0	0	0		0		0				0	0	0	0	0 1		0		0	0			0	0	2.75	to	2.85
No.																																			
No. 2																																			
No.	30		. 0	0		0	0 0			0	q	0		0	0	0	0 1				D	0			. 0	0	0	0	0 1		0		3.20	10	3.30

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice, as also are the following:

#### Corrugated Roofing Sheets by Weight.

Effective April 18, 1912, the rates for painted and formed roofing sheets, per 100 lb., as announced by most of the leading sheet manufacturers, are based on the following extras for painting and forming over prices for corresponding gauges in black and galvanized sheets:

W. College	Ga 29	uges, centi		100 lb. 12 to 18
Painting.				
Regular or oiling			0.10	
Graphite, regular	0.010	0.25	0.15	0.10
Forming.				
2, 21/2, 3 and 5 in. corrugated.	0.05	0.05	0.05	0.05
2 V-crimped, without sticks		0.05	0.05	***
54 to 11/4 in. corrugated		0.10	0.10	211444
		0.10	0.10	111000
3 V-crimped, without sticks	0.10	0.10		***
Pressed standard seam, with			11117	
cleats	000	0.15	0.15	***
Plain roll roofing, with or				
without cleats		0.15	0.15	****
Plain brick siding		0.20	, , , ,	105000
		0.20	0.20	
3-15 in. crimped			0.25	***
Weatherboard siding	000	0.25		***
Beaded ceiling	000	0.25	0.25	***
Rock face brick and stone				
siding		0.25	0.25	12000
Roll and cap roofing, with caps		-		
and cleats	0.25	0.25	- Ar	
	0.00	0.43	***	** *
Roofing valley, 12 in. and		0.00	0.00	
wider	000	0.25	0.25	* * *
Ridge roll and flashing (plain				
or corrugated)		0.65	0.65	0.65

Corrugated Roofing Sheets, with 21/2-in. Corrugations, per Square.

Some leading manufacturers of roofing material are still quoting on an area basis and are naming prices as follows:

Gauge.	Painted.	Galvanized.			Galvanized.
29		\$2.40	23	. \$2.30	\$3.50
28	\$1.35	2.55	22	. 2.50	3.80
27		2.60	21	. 2:70	4.05
26		2.65	20		4.35
25	1.80	3.05	18	. 3.90	5.70
24	2.00	3.15	16		6.50

Boiler Tubes.—Discounts on lap welded steel and standard charcoal iron boiler tubes to jobbers in carloads are as follows:

Steel.	Standard Charcoal Iron.
134 to 21/4 in 64	1½ in 48
2½ in 66½	134 to 21/4 in 50
23/4 to 31/4 in 711/2	2½ in
3½ to 4 in	234 to 314 in
7 to 13 in	Locomotive and stamship spe-

2½ in. and smaller, over 18 ft., 10 per cent. net extra. 2¼ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points.

# Pittsburgh

PITTSBURGH, PA., July 10, 1912.

The expected quieting down in volume of specifications and new business in the steel trade has come, and it is probable that July and August will show a marked falling off from the great activity in June. A falling off in specifications and new business is not construed to mean that the steel business is shrinking, but as simply a natural condition due to the heavy specifications over the last three or four months. Buyers are covered for a considerable time ahead, and in June specifications were of enormous volume, due to fear of cancellation of contracts expiring on June 30; thus many consumers are out of the market and will be for some time to come. The mills have an enormous volume of business booked ahead at lower prices than are now ruling, and in many cases it will take three to six months or longer before this low priced business is cleaned up and off the books. The average of prices over the third quarter will be slightly better than second quarter, but will not be high enough to allow the mills more than a fair profit. Output of pig iron, steel and finished material is much heavier now than ever in the history of the steel business, but the product seems to be going into actual consumption and consumers are urging shipments to fill their wants. The belief in the trade is that there will not be any serious political disturbance, and with the assurance of good crops the steel business is expected to take on fresh impetus in the fall. The pig iron market is quiet, with prices ruling steady but no higher. The supply of steel seems ample just now to meet the heavy consumption, and consumers are getting billets and sheet bars about as fast as needed, while premiums for prompt delivery have largely disappeared. On finished lines the mills are comfortably filled through third quarter, with the exception of wire; on plates and bars they are about filled up for the rest of the year and nearly as well on shapes. The coke trade is still claiming more than the usual amount of attention, with the situation this week

Pig Iron.—The local pig iron market continues dull and no large inquiries are up. Some sellers are asking \$13.50 for basic for prompt shipment, but small sales continue to be made at \$13.25 at Valley furnace. Just now there seems to be less chance of some of the coke operators getting \$2.50 for their coke for last half of the year and this has had its effect on pig iron prices, which do not seem to be quite as firm as they were last week. A number of merchant blast furnaces are ready to go in and will resume as soon as their owners can buy coke at what they term reasonable prices, their ideas being from \$2 to \$2.10 for standard makes of furnace coke. The idle blast furnaces in the Valley districts that are likely to go in within the next month or so include Grace of the Brier Hill Steel Company, one Andrews & Hitchcock stack and Mattie furnace of the Girard Iron Company. Sales of pig iron in the past week have been very light. We note one of 3000 tons of malleable Bessemer to a steel car concern for the

last half of the year at \$13.25 Valley furnace. We also note 300 tons of No. 2 foundry for last half at \$13.50 and 300 tons of No. 3 at \$13.25 Valley furnace. The Westinghouse Electric & Mfg. Company is in the market for 1000 tons of No. 2 foundry for its plant at Attica near Buffalo, N. Y. Prices are fairly strong and we quote: Bessemer iron, \$14.25; basic, \$13.25 to \$13.50; Northern No. 2 foundry prompt delivery, \$13.25 and for last half, \$13.50; malleable Bessemer, and gray forge, \$13, all at Valley furnace, the freight rate to Pittsburgh district being 90c. a ton.

Steel Billets and Sheet Bars.—Reports in the press that offers of \$24 and \$25 a ton had been made for sheet bars for prompt delivery are untrue. The supply of steel at present seems adequate to meet the existing demand and none of the sheet or tin plate mills is suffering for lack of prompt deliveries. A short time ago slight premiums were paid on billets and sheet bars for prompt shipment, but this is no longer the case. The Pittsburgh Steel Company is about the only local seller of open hearth billets. This company is not running its rod and wire mills at Monessen full time and has a surplus of steel which it is selling in the open market. Specifications against contracts are coming in freely, but will show a falling off this month as compared with June. We quote for delivery in third quarter as follows: Bessemer and open-hearth billets, \$21.50 to \$22; Bessemer and open-hearth sheet bars, \$22 to \$22.50; axle billets, \$25 to \$26; forging billets, to be used for general forging purposes, \$28, all f.o.b. cars Pittsburgh or Youngstown mill.

Ferroalloys.—The recent scarcity in supply of ferromanganese for prompt shipment has entirely disappeared and some dealers are offering it for prompt shipment at slightly less than the regular price for future delivery, which is \$48.50 Baltimore. Some German ferromanganese has come into this country recently and while this is not as regular in percentage of manganese as the English and in cases runs a little higher in sulphur, a fair amount of it has been sold and has relieved the pressure on the market for prompt shipment. There is little doing in either ferrosilicon or ferromanganese, as nearly all consumers are covered over remainder of this year. We quote 80 per cent. English ferromanganese at \$48.50, Baltimore, for delivery over the last half of this year and into the first half of 1913, while small lots for prompt shipment are bringing \$50 to \$52, f.o.b. Baltimore. We quote 50 per cent. ferrosilicon in lots up to 100 tons at \$72.50; over 100 tons to 600 tons, \$71.50, and over 600 tons, \$70.50, Pittsburgh. The lower grades are ruling at about \$20 for 10 per cent.; \$21 for 11 per cent.; \$22 for 12 per cent., f.o.b. cars at furnace, Ashland, Ky., or Jackson, Ohio. On ferrotitanium we quote 8c. per lb. for carload lots; 10c. per lb. in 2000-lb. lots and over, and 12½c. per lb. in lots up to 2000 lb.

Wire Rods.—Some contracts for both Bessemer and open hearth rods are reported to have been placed recently on the basis of about \$25 Pittsburgh, for remainder of the year delivery, but it is known that some desirable business has been closed for such delivery at about 50c. a ton under this price. Specifications against contracts for rods are coming in quite freely, and we quote Bessemer and open hearth rods \$25, Pittsburgh. On a very desirable specification this price might be slightly shaded.

Muck Bar.—There is some new inquiry for muck bar, but the available supply is very limited. A sale of 1000 tons of standard grade for July and August shipment is reported at about \$30, Pittsburgh. We quote best grades of muck bar, made from all pig iron, at \$29.50 to \$30, Pittsburgh.

Skelp.—The activity in the pipe trade is reflected in skelp, new demand for which is good, while the mills rolling skelp are sold up for the next six to eight weeks or longer. We quote grooved steel skelp at 1.20c.; sheared steel skelp. 1.25c.; grooved iron skelp, 1.65c. to 1.70c., and sheared iron skelp 1.70c. to 1.75c., delivered buyer's mill in the Pittsburgh district.

Steel Rails.—A fair amount of new business is being placed in standard sections, but no large contracts have been taken by the local mills for some little time. A good part of the new tonnage in standard sections coming to the Carnegie Steel Company is for export, and where open hearth rails are specified in these contracts they are rolled at its Ohio Works at Youngstown. New business in light rails is active and in the past week the Carnegie Steel Company received new orders and specifications against contracts for about 5200 tons. We quote splice bars at 1.50c. per lb. and rails as fol-

lows: Standard sections, 1.25c. per lb.; 8 and 10-lb., light rails, 1.20½c.; 12 and 14-lb., 1.20c.; 16 and 20-lb., 1.15c.; 25. 30, 35, 40 and 45-lb., 1.10c., in carload lots, f.o.b. Pittsburgh.

Steel Car Wheels.—The steel car companies are buying quite freely of both cast iron and steel wheels for
freight and passenger service. The Carnegie Steel
Company has recently taken some good orders for its
Schoen steel wheels for which the demand is said to
be steadily increasing. We quote 33-in. by 2½-in.
rim rolled steel car wheels for freight service at \$14
to \$14.50 per wheel and 36-in, rim rolled steel wheels
for passenger service at \$18.50 to \$19 per wheel, f.o.b.
Pittsburgh.
Structural Metalich

Structural Material.-A large amount of new inquiry is out and the structural shops are gradually being filled up with work and for a considerable period ahead. One local fabricating interest reports that it is practically filled up into the next year and is not bidding on a good deal of the new work that is coming bidding on a good deal of the new work that is coming up. This company recently turned down 600 tons for which it was offered cost price plus percentage for profit. The Jones & Laughlin Steel Company has taken about 1000 tons for new steel buildings for the Armstrong Cork Company in this city and about 500 tons for the new plant of the Duff Mfg. Company on the North Side. The Riverside Bridge Company, Wheeling, W. Va., has taken 900 tons for a new steel building for the First National Bank at Huntington, W. Va., and about 1000 tons for new steel buildings. building for the First National Bank at Huntington, W. Va., and about 1000 tons for new steel buildings for the Owens-Eastern Bottle Company at Clarksburg, W. Va. The contractor for the Magee Hospital in this city promises to place the steel, about 900 tons, this week. Steel fabricators state that prices are slightly better, but work is still going pretty cheap on account of the fact that nearly all consumers are covered for some time ahead with material at about 1.15c. to 1.20c. We quote beams and channels up to 15 in. on new orders at 1.30c., Pittsburgh.

Plates.—New orders for steel cars have been light in

Plates.-New orders for steel cars have been light in Plates.—New orders for steel cars have been light in the past week, but it is stated that three or four of the large roads will make inquiries within the next month. The Baltimore & Ohio has placed 1000 steel underframes with the Ralston Steel Car Company, of Columbus, Ohio, and 400 with the Pressed Steel Car Company. The Bessemer & Lake Erie has placed 20 all steel gondolas with the Ralston Steel Car Company and the Harriman Lines 50 electric motor cars with the Jewett Car Company of Newark, Ohio. The plate mills are filled up with business over the next three months, and on universal plates three of the leading and on universal plates three of the leading mills state that they are practically filled for the rest of this year. The market is firm and we quote 1/4 in.

Steel Page A. S

Steel Bars.—As yet only a comparatively small amount of business has been placed in steel bars at the new price of 1.25c., as nearly all consumers are covered by contracts placed some time ago at 1.10c. to covered by contracts placed some time ago at 1.10c. to 1.15c., deliveries running over remainder of the year, while most of the implement makers are covered at 1.15c. up to July 1 of next year. Specifications against contracts have been very heavy, but are expected to slacken down a little this month. The mills rolling iron bars report that demand is fairly active and consumers covered by contracts are specifying quite freely. We quote steel bars on new orders at 1.25c. for shipment within the next eight to ten weeks, and iron bars 1.35c., f.o.b. Pittsburgh. It is stated that premiums of \$1 to \$2 a ton have been paid for steel bars for shipment within a week or two from date of order.

Cotton Ties.—The season trade in cotton ties is

Cotton Ties.—The season trade in cotton ties is about over. A few small orders are still coming in, for which the mills are getting 72c. a bundle, f.o.b.

Hoops and Bands.—Effective July 10, the Carnegie Steel Company announced an advance in hoops of \$2 a ton, or from 1.30c. to 1.40c., f.o.b. Pittsburgh. The a ton, or from 1.30c. to 1.40c., f.o.b. Pittsburgh. The advance has been expected for some time as hoops have been selling on practically the same basis as bands, and usually there is a differential in favor of hoops over bands of \$3 a ton. The Sharon Steel Hoop Company and the Pittsburgh Steel Company will, it is expected, also advance their price on hoops to 1.40c. New demand is quiet, as large buyers have covered for some time ahead at about 1.30c., and there are some contracts existing at 1.25c.

Sheets.—Effective on Wednesday, July 3, the American

Sheets.—Effective on Wednesday, July 3, the American Sheet & Tin Plate Company and practically all other makers of sheets announced an advance of \$1 at ton on blue annealed sheets, effective from that date. The minimum price on Nos. 3 to 8 gauge, blue annealed sheets, is now given as 1.30c., while some mills are

quoting 1.35c. Demand for black and galvanized, roofquoting 1.35c. Demand for black and galvanized, roofing sheets and blue annealed sheets is referred to by the makers as very heavy, while specifications in June, particularly in the last week in that month, came in very freely. All the sheet mills have a large amount of business on their books for delivery in third quarter and a good many orders booked for delivery in last three months of the year. Advices are that the sheet mills canceled on July 1 any unspecified tonnage on contracts. There is still a considerable shortage in labor at all the sheet mills, but the delivery of sheet bars by the steel mills is fairly satisfactory.

Tin Plate.—The new business being placed is con-

Tin Plate.—The new business being placed is considered fair, seeing that this is the dull season of the year. The tone of the tin plate market is strong, and on year. The tone of the tin plate market is strong, and on new inquiries makers as a rule are not inclined to shade \$3.50 per base box. It is expected that in September or October the can makers and meat packers will come in the market to place contracts for winter and spring delivery. The Trumbull Steel Company, organized some time ago to build a new tin plate plant at Warren, Ohio, has contracted for steel buildings with the Riter-Conley Mfg. Company of this city, and has also placed contracts for nine hot tin mills and eight stands of cold mills. This new plant is expected to be completed about January 1. The tin plate mills report that decontracts for nine hot tin mills and eight stands of cold mills. This new plant is expected to be completed about January 1. The tin plate mills report that deliveries of tin plate bars by the mills are better than for some time. We quote tin plate in large lots at \$3.40 to \$3.50 base, for 14 x 20 coke plates, f.o.b. Pittsburgh. Jobbers charge the usual advances over these prices for small lots from store.

Bolts and Rivets.-New demand for bolts and rivets is very heavy, two important local makers stating they are filled up for the next three months and are not are filled up for the next three months and are not booking any new orders except for delivery in October or later. It is probable there will be an advance of 5 to 7½ per cent. in prices of rivets and bolts before this week is out, but at this writing no advices have been received that it has gone into effect. Makers state that higher prices are justified by reason of the heavy consumption and the higher prices they are paying for steel. We quote button head structural rivets at \$1.60 and cone head boiler rivets at \$1.70 per, 100 lb. base in carload lots, f.o.b. Pittsburgh. Prices on bolts are very strong, and we quote G. P. coach and lag screws 80 and 20 per cent. off, small carriage bolts, cut threads, 80 and 7½ per cent. off, small carriage bolts, rolled threads. 80 and 15 off; large carriage bolts, 75 and 10 off; small machine bolts, rolled threads, 80 and 20 off; small machine bolts, rolled threads, 80 and 12½ off; large machine bolts, 75 and 15 off; square hot-pressed nuts, blank and tapped, \$6.30 off, and hexagon nuts, \$7.10 off. These tapped, \$6.30 off, and hexagon nuts, \$7.10 off. These prices are in lots of 300 lb. or over delivered within a 20c. freight radius of maker's works.

Shafting.-New demand is mostly for small lots, but consumers are specifying at a fairly satisfactory rate against contracts. It is stated that the discounts adopted some time ago are being fairly well maintained. We quote cold rolled shafting at 65 per cent. off in carloads and larger lots and 60 per cent, in less than carload lots delivered in base territory.

spelter.—The market continues very strong and prime grades of Western spelter are firm at 7c. East St. Louis or 7.12½c. Pittsburgh.

Railroad Spikes.—The Louisville & Nashville Railroad is reported to have contracted for about 11,000 kegs of railroad spikes, the business having been divided between two makers. Specifications against contracts placed by the railroads some time ago are heavy and all the spike makers are somewhat back in deliveries. We quote railroad spikes in base sizes, 5½ x 9/16 In. at \$1.50 and small railroad and boat spikes \$1.60 base per 100 lb. f.o.b. Pittsburgh. \$1.60 base per 100 lb. f.o.b. Pittsburgh.

Syzkylot in at \$1.50 and shall rain out and boat spikes \$1.60 base per 100 lb. f.o.b. Pittsburgh.

Wire Products.—A fair amount of new busines is being placed in wire and wire nails, mostly in small lots to cover current needs, but recently some contracts have been made for Fall delivery at the full price of \$1.60 base per keg for wire nails, except in certain Southwestern territory, where a lower price is made to meet competition of Ohio river mills, which have an advantage in freight rates. The makers of wire and wire nails are anticipating a heavy fall trade. We quote wire nails at \$1.60; cut nails, \$1.55; galvanized barb wire, \$1.90; painted, \$1.60; annealed fence wire, \$1.40, and galvanized fence wire, \$1.70, f.o.b. Pittsburgh, usual terms, freight added to point of delivery.

Merchant Steel.—New business and specifications will probably show a slight falling off in this month and August as compared with May and June. Prices are very firm, as follows: Iron finished tire, 1½ by ¾ in. and larger, 1.20c. base, under ¾ in., 1.35c. base; planished tire, 1.45c.; channel tire, ¾, ¾ and 1 in., 1.70c.; 1¼ in.

and larger, 1.6oc.; toe calk, 1.75c. base; flat sleigh shoe,

and larger, 1.60c.; toe calk, 1.75c. base; flat sleigh shoe, 1.25c.; concave or convex, 1.60c.; cutters shoes, tapered or bent, 2.20c.; spring steel, 1.80c.; machinery steel, smooth finish, 1.60c., all f.o.b. cars Pittsburgh

Merchant Pipe.—It is stated that the new discounts on both iron and steel pipe representing \$2 a ton advance are being very firmly held, and the new demand for merchant pipe is very heavy, all the mills being back in deliveries from four to eight weeks. The Ohio Fuel Supply Company is credited with having placed six miles of 12 in. and 20 miles of 6 in. line pipe and the Kaney Rivery Gas Company of Tulsa, Okla., has bought 20 miles of 8 in. pipe. Some low quotations on large lots of pipe put out in June have been withdrawn large lots of pipe put out in June have been withdrawn and the market is very strong. The new discounts are represented by 80 per cent. on black and 72 for galvanized for 34 to 1½ in. steel pipe, and 74 per cent. for black and 63 per cent. for galvanized iron pipe 34 to 1½ in. These are jobbers' carload discounts, card

Boiler Tubes .- Demand is active and specifications from the railroads on the large contract for boiler tubes placed sometime ago are coming in very freely. Prices

placed sometime ago are coming in very freely. Prices on both merchant and boiler tubes are very firm.

Coke.—The deadlock between the coke makers and the furnace operators assumed a new phase in the past week. G. K. Moore, said to be working in the interest of the Department of Justice, is quoted as claiming that a combination exists between Connellsville coke producers for the purpose of keeping down output and thus forcing the furnace operators to pay \$2.50 for coke thus forcing the furnace operators to pay \$2.50 for coke for last half of the year. It is said that evidence has been gathered and sent to Washington. The coke operators claim there is nothing in this report and operators claim there is nothing in this report and deny absolutely they have done anything that would render them liable to Government action. The situation in the coke trade this week does not seem to be quite as strong as last week, and prompt furnace coke is being offered more freely at \$2.25 at oven or lower. A number of the smaller coke operators that have not sold any coke for delivery over last half and have not shipped out any so far this month, are said to be getting more uneasy over the situation and whether they will continue to pile coke or blow out their ovens, waiting until they can get \$2.50 for their coke is a question. until they can get \$2.50 for their coke is a question. One leading furnace operator claims to have bought recently 5000 tons of furnace coke per month for last half of the year delivery at \$2.25 at oven for standard grades. Output of coke in the Upper and Lower Connellsville regions last week was 392,640 tons, a gain on the previous week of about 20,000 tons. Sales are reported of about 120 cars of prompt furnace coke at \$2.50 per net ton at oven. We quote standard grades of furnace coke for prompt shipment at \$2.25 to \$2.50 of furnace coke for prompt shipment at \$2.25 to \$2.50

of furnace coke for prompt shipment at \$2.25 to \$2.50 per net ton at oven and these prices are also being quoted on contracts for last half of the year delivery. Standard makes of 72-hr. foundry coke are slightly lower and are being offered at \$2.50 to \$2.75 per net ton at oven for delivery over the remainder of the year.

Iron and Steel Scrap.—The market shows no material change in the past week, with the exception that prices on heavy melting steel iron and steel borings and low phosphorus melting stock are slightly easier. Several leading consumers of scrap have notified dealers recently to shut off shipments and embargoes on scrap destined for leading consuming points is looked for this week. We have reduced prices slightly on borings and turnings, and on low phosphorus melting stock. and turnings, and on low phosphorus melting stock. No large sales of scrap have been made in the past week and the whole market is only fairly firm. Dealers

quote as follows, per gross ton:

Heavy steel scrap, Steubenville, Follansbee, s Brackenridge, Sharon, Monessen and Pitts-	
burgh delivery	\$13.50
No. 1 foundry cast\$13.00 to	13 25
No. 1 foundry cast	13.23
No. 2 foundry cast 11.50 to	11.75
Bundled sheet scrap, f.o.b. consumers' mills,	52.5
Pittsburgh district 12.00 to	12.25
Rerolling rails, Newark and Cambridge,	
Ohio, Cumberland, Md., and Franklin, Pa. 14.00 to	14.25
No. 1 railroad malleable stock 12.50 to	
Grate bars 9.75 to	10.00
Low phosphorus melting stock 15.50 to	15.75
Iron car axles 22.50 to	
Steel car axles 15.75 to	
I ocomotive axles	22.50
No. 1 busheling scrap 12.50 to	12.75
No. 2 busheling scrap 8.50 to	8.75
Old car wheels 14.00 to	14.25
*Cast iron borings 9.50 to	9.75
*Machine shop turnings 10,25 to	
†Sheet bar crop ends 14.75 to	
Old iron goile	
Old iron rails	14.00
No. 1 wrought scrap	14.00
Heavy steel axle turnings 11.00 to	11.25
Stove plate 10.25 to	10.50

<sup>\*</sup>These prices are f.o.b. cars at consumers' mills in the Pittsburgh district. †Shipping point.

# Philadelphia

PHILADELPHIA, PA., July 9, 1912.

New business has been in excess of general expecta-tions, notwithstanding the holiday and semi-annual stock taking period. Suspensions of mill operations have been brief, owing to urgent requests for deliveries. Scarcity of labor, together with the excessively hot weather, are restricting production to some extent, while specifications, together with new orders, have in while specifications, together with new orders, have in several instances largely exceeded the weekly capacity of producers. The recent price advances are well maintained and premiums are paid in some lines for prompt shipment. Further buying of billets in this market by Western consumers is noted. Increased inquiry for billets and heavy plates for export are reported. Univer-Western consumers is noted. Increased inquiry for billets and heavy plates for export are reported. Universal plates have been advanced \$1 a ton by some Eastern makers. A fair volume of business is moving in pig iron and higher asking prices are more general. Sales of steel making grades have been heavier. The coke situation is still deadlocked, although makers look for easier prices on contract furnace coke before long. Old material transactions are light, but the market continues firm. One of the local shipyards has the contract for six barges for the Government, requiring 6000. tract for six barges for the Government, requiring 6000 tons of plates and shapes.

Iron Ore.—The market has practically been at a standstill. Importations during the week include 11,150 tons of Cuban, 6056 tons of Swedish, 5150 tons of New Brunswick and 4895 tons of Spanish ore. Total importations during the first half of the year aggregate

New Brunswick and 4895 tons of Spanish importations during the first half of the year aggregate 641,661 tons.

Pig Iron.—The advancing market has brought about some apparent irregularity in prices. Higher asking prices are named by practically all makers in this district, although occasional sales at the old prices crop out, but these have been largely against old quotations, which have been pretty generally withdrawn. A larger proportion of the current business in standard brands of No. 2 X eastern Pennsylvania foundry iron is moving at \$15.75, delivered in this district, although early in the week sales against old quotations were made at \$15.50, delivered, for third quarter shipment. For extended delivery \$16 to \$16.25 is quoted for this grade. A fair volume of business, considering the season, is reported. In Virginia foundry grades somewhat more active conditions are noted, with numerous small and moderate lots of No. 2 X foundry going for third quarter shipment at \$13, Virginia furnace. Sales for October delivery have been made at \$13.25, and for fourth quarter shipment at \$13.50, furnace. An inquiry for 2000 to 3000 tons of low grade iron from a Virginia pipe maker is noted. While Delaware River cast iron pipe makers have not come out with further definite inquiries orders are being placed for miscellaneous odd lots at about \$14.75, delivered, while several round lots of pipe forge were disposed of against previous inquiries for close to \$15, delivered. Rolling mill forge iron has not been very active, although prices are strong, \$15, formace and the properties are strong, \$15, formace and the properties are alized on one block, on which the for close to \$15, delivered. Rolling mill forge iron has not been very active, although prices are strong, \$15, furnace, being realized on one block, on which the freight figured as an extremely small factor. The movement in basic iron last week aggregated about 11,000 tons, all taken by one consumer; 6000 tons, were for ment in basic iron last week aggregated about 11,000 tons, all taken by one consumer; 6000 tons were for fourth quarter shipment at \$15.50, delivered; the remainder for third quarter at a shade under that figure. Basic makers are now practically all holding at \$15.75, delivered, for that grade. Considerable movement in low phosphorus iron, both standard and Lebanon grades, is noted. Sales of standard analysis iron for last half delivery, aggregating 5000 tons, have been made to two consumers in this district at \$20, delivered. A sale of several thousand tons of Lebanon low phosphorus is noted and makers of this grade have advanced prices about 50 cents a ton to \$16.50 to \$17, furnace. Small lots of standard analysis low phosphorus have been sold at \$20.25, delivered here. Producers have the situation pretty well in hand; orders equal, as a rule, more than the current make and stocks of marketable grades are low. The shortage of labor, together with higher fuel costs, restrict the blowing in of additional capacity. Urgency for delivery on contracts is increasing, and a continued demand would, under existing conditions, develop a secretiv in some grades. Some eligible versiones Urgency for delivery on contracts is increasing, and a continued demand would, under existing conditions, develop a scarcity in some grades. Some slight variance as to prices of some grades is noted, due largely to closing of old options. Standard brands, however, are now firmly quoted and considerable business has, in instances, been done at the following range of prices, delivered in buyers' yards in this district:

Fastern Pennsylvania No. 2 X foundry		
- Eastern Fennsylvania No. 2 plain - \$15.25 to 1	5.75	
Virginia No 2 V faundeu	5 50	
15.80 to 1	con	
rityinia No. 2 plain	5 75	
Gray forge	5 00	
Dasic 15 50 to 1	5 75	
Standard low phosphorus 20.00 to 2	25	

Ferroalloys.—The demand for ferromanganese has been light, confined principally to miscellaneous lots for which the usual quotation of \$48.50, Baltimore, is named. Ferrosilicon is quiet with prices firm and unchanged.

Billets.—Further buying in the east by western consumers is noted, one 5000 ton order for ordinary rolling billets being placed at full prices this week. A very good demand for both rolling and forging steel in miscellaneous lots for early delivery is reported, and sales aggregate a very fair total. A moderate demand for rolling billets for export, usually in 500 ton lots, is also reported. Mills are fully engaged and prices are very firm, ordinary soft basic open-hearth billets being quoted at \$24.40 to \$25.40, delivered here, while ordinary forging billets are on a minimum basis of \$29.40, delivered here.

Plates.—The demand for universal plates has been so heavy that makers have, in instances, advanced prices \$1 a ton and find it difficult to handle the business offered, owing to the crowded condition of the mills. There was no let up in the demand for plates last week. A large volume of miscellaneous business was entered at the new price basis and in one instance specifications received equaled twice the weekly capacity of the mill. A heavy-demand for universal plates from Canada and abroad is noted, in instances 1000 ton lots are asked for. Specifications for car work have been heavy and deliveries are hardening materially, the heated term together with the scarcity of common labor affecting the productive rate of the mills. Ordinary heavy steel plates for near future delivery in this district are firm at 1.45c. to 1.50c., while universal plates are quoted at 1,50c. to 1.55c. delivered.

Structural Material.—While a fair volume of transient business in plain shapes has been moving, pending negotiations in connection with larger propositions move slowly. Bids against the steel requirements for the Philadelphia & Reading viaduct work went in om-July 5. The Adelphia Hotel, heretofore designated as the Hotel Fairmount, will go, it is stated, to the leading interests, as will also the fabricated work for the Curtis building. Several other large propositions are pending. Moderate orders for bridge work have recently been placed. Higher prices for fabricated material are being more generally quoted, while plain material makers are, in instances, quoting 1.50c., delivered, as a minimum. The general market for plain shapes, however, ranges from 1.45c. to 1.50c., although with mills fully occupied little in the way of early deliveries can be had at the inside quotation.

Sheets.—Mills report a very good volume of new business, with prices on a slightly higher level. Western No. 10 blue annealed sheets are quoted at 1.60c., and No. 28 gauge at 2.10c. to 2.15c., delivered here, with eastern mills, making smooth loose rolled sheets, obtaining 1/2c. to 1/2c. per lb. advance. While there have been few contracts entered, current business has been in sufficient volume to keep eastern mills occupied at full capacity.

Bars.—Eastern mills are making efforts to get prices on a higher basis, and while 1.32½c. to 1.35c. is named for desirable business by some mills others quote 1.35c. to 1.37½c., delivered, according to grade. New business, however, has not been very heavy and in but few instances are the higher quotations being realized. Specifications against contracts for steel bars have been good, but little business has been entered at the 1.40c., delivered here, basis.

Coke.—While producers and consumers have not yet agreed on prices of contract furnace coke for second half consumers believe that the quoted \$2.40 to \$2.50, oven, will not be realized. A round lot for July delivery was recently purchased by a Schulkill Valley furnace at \$2.20, oven. Small spot lots are also being picked up at prices close around \$2, at oven. A fair volume of business is moving in foundry coke at \$2.40 to \$2.50. The following range of prices per net ton is named for delivery in buyers' yards in this district, inside prices representing quotations for prompt shipments:

Connel'sville	furnac	e c	oke		4					 0						\$4.10	10	\$4.70
Connellsville	found	rv	coke			 		0				5				4.55	of	4.70
Mountain f	urnace	colke				 					1.	0				3.70	to	4.30
Mountain f	oundry	coke	B	0		 	0	0	0 0	0		0	0	0 .	0 1	4.15	to	4.30

Old Material.—The market continues dull, with prices well maintained. Small lots of No. I heavy melting steel are sold at \$13.50, delivered, and it is stated that \$13.75 bid on railroad steel last week brought little tonnage to the bidder. Mills are holding at a material advance for low phosphorus scrap, and while some

small lots have been sold by dealers at \$16.75 no tonnage could be entered with the mills under \$17.25 to \$17.50, delivered. Cast borings show a trifle more strength and quotations cover a somewhat wider range. The following range about represents the market for prompt deliveries in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate varying from 35c. to \$1.35 per gross ton:

	NY	
	No. 1 heavy melting steel scrap and crops. \$13.50 to	\$14.00
	Old steel rails, rerolling (nominal) 14.75 to	15.25
	Low phosphorus heavy melting steel acran 16.25 to	16.75
	Old steel axles 17.50 to	18.00
		25.00
	Old iron rails (nominal) 16.50 to	17.00
	Old car wheels	14.50
	No. 1 railroad wrought	16.00
	Wrought iron pipe 12.50 to	13.00
	No 1 force for	
	No. 1 forge fire 12.00 to	12.50
	No. 2 light iron (nominal) 7.00 to	7.50
	wrought turnings 10.50 to	11.00
	Cast borings 9.50 to	10.00
7	Machinery cast	14.25
	Grate bars, railroad 10.50 to	
	Change pars, ramond	11.00
	Stove plate 10.50 to	11.00
	Railroad malleable (nominal) 12.00 to	12:50

# Cleveland

CLEVELAND, OHIO, July 9, 1912.

Iron Ore.—Ore shipments in June broke all previous records. The movement was 7,567,555 gross tons, or ever 200,000 tons more than the previous best month in 1910. Shipments until July 1 were 13,690,671 tons, which is only 1,227,587 tons less than during the same period of the record breaking year of 1910. The movement now is heavier than in June, and it is expected that within a month or two this season's shipment will exceed those during the corresponding period in 1910. The June shipments exceeded that of June a year ago by 2,747,330 tons. Of the shipment during the past month 5,710,089 tons were sent to Lake Erie docks, and other ports received 1,512,746 tons. Stocks of ore on Lake Erie docks on July 1 amounted to 6,031,686 tons, as compared with 6.746,638 tons on July 1, 1911. We quote prices at Lake Erie docks as follows: Old Range Bessemer, \$3.75; Mesaba Bessemer, \$3.50; Old Range non-Bessemer, \$3.05 and Mesaba non-Bessemer, \$2.85.

\$3.05 and Mesaba non-Bessemer, \$2.85.

Pig Iron.—While the market is not active, a monerate volume of business is being done in Northern foundry grades, in lots of 100 to 500 tons. A number of small lot sales were made and a number of inquiries for small lots are now pending. Some foundrymen find that they will need more iron than they originally purchased for their last half requirements. The market is very firm and the tendency is toward a stiffening of prices. Local sellers have been able to close at \$13.50 for No. 2 foundry for outside shipment. However, the \$13.25 price for shipments from Cleveland and Valley furnaces has not disappeared. For Cleveland delivery local furnaces are holding firmly to \$13.75, delivered, for No. 2. There is practically no inquiry for Southern grades. For prompt shipment and last half we quote, delivered Cleveland, as follows:

Bessemer								 		dune.	\$15.15
Basic								 			13.75
Northern '											
Southern	No.	12	four	dry				 			15.35
Gray forg											
Jackson si	lver	y, 1	B per	ce	nt.	silic	con.	 	.\$17	7.30 to	17.55

Coke.—The market is very firm and producers claim that there are strong indications that a settlement of the deadlock is in sight and that furnace operators will pay the advance in price to \$2.50. Spot furnace coke is held at from \$2.50 to \$2.60. The foundry coke market is fairly good. A number of contracts have been placed at \$2.75 per net ton. Little standard 72-hr. Connellsville coke appears available at a lower price. Leading Wise Country producers have advanced prices on foundry grades to \$2.75.

Finished Iron and Steel.—Mills generally report a heavy volume of specifications, the tonnage ordered showing little falling off as compared with the previous week when there was a rush of orders due to the expiration of contracts on July I. While not much new business is coming out there is considerable tonnage in prospect for specific work on which manufacturers are figuring. Agricultural implement manufacturers are commencing to specify considerable steel bar tonnage on new contracts. There is a fair volume of inquiry for billets and sheet bars. Plates are scarce for early delivery. Sales of universal plates are being made in this market by Eastern mills at 1.35c. at mill, which amounts to a premium of practically \$3 a ton. for delivery in four or five weeks, and offers of higher

prices are being made for prompt shipment. The structural demand is more active and fabricators are getting better prices for their work. The Riverside Bridge Company, Wheeling, W. Va., has taken 800 tons for a plant in Toledo for the Owens Eastern Bottle Company. T. H. Brooks & Co., Cleveland, have taken 165 tons for a building for the Republic Rubber Company, Youngstown, Ohio. The American Bridge Company has taken 150 tons for the Ozark Smelting & Refining Company, Magdalena, New Mexico, and the Canton Bridge Company, Canton, Ohio, has taken 100 tons for a building for the Timken Roller Bearing Company, Canton. The Lake Shore Railroad has an inquiry out for 500 tons of steel for the West Madison Avenue bridge, in Cleveland. The demand for sheets is heavy and some of the mills are considerably behind on deliveries. Sheet prices are firmer. The general quotation is 1.95c. for No. 28 black and 3c. for No. 28 galvanized. Makers of hard steel bars have advanced prices to 1.25c. for small orders. For round lots 1.20c. is still quoted. The demand for iron bars continues heavy and local mills have made another advance in price to 1.35c. at mills.

Old Material.—The market is very quiet. Mills are well supplied and there is little inquiry. Some of the

Old Material.—The market is very quiet. Mills are well supplied and there is little inquiry. Some of the consumers are not taking scrap on contract as fast as sellers would like. Prices are firm but buyers do not look for any further advance. Dealers expect an active market during the latter part of the month. Railroad scrap offered last week brought good prices. The Norfolk & Western Railroad will receive bids on a large list July 18. Dealers prices, f.o.b. Cleveland, are as follows:

rer Gross 10n.	
Old steel rails, rerolling\$12.75 to \$13.00	
Old iron rails 14.00 to 14.50	
Steel car axles 17,50 to 18.00	
Heavy melting steel 12.50 to 12.75	
Old car wheels 13.00 to 13.50	
Relaying rails, 50 lb. and over 22.50 to 23.50	
Agricultural malleable 10.50 to 11.00	
Railroad malleable	
Light bundled sheet scrap 9.50 to 10.00	
Per Net Ton.	
Iron car axles\$18.50 to \$19.00	
Cast borings 7.25 to 7.50	
Iron and steel turnings and drillings 7.75 to 8.00	
Steel axle turning's 8.50 to 8.75	
No. 1 busheling	
No. 1 railroad wrought	
No. 1 railroad wrought	

# Boston

Boston, Mass., July 9, 1912.

Boston, Mass., July 9, 1912.

Old Material.—The midsummer dullness has set in, but prices remain firm. The large dealers are feeling the effect of the scarcity of labor among the forges and rolling mills, which in some cases are requesting that shipments be delayed. The quotations given below are of prices offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points, taking Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of \$2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices. than dealers' prices.

Heavy melting steel\$10.2	5 to	\$10.75
Low phosphorus steel 11.4	5 to	11.95
O'd steel axles 14.0	0 to	14.50
Old iron axles 17.0		
Mixed shafting 13.0		
No. 1 wrought and soft steel 10.0		
Skeleton (bundled) 8.2	5 to	8.75
Wrought iron pipe 9.2	5 to	9.75
Cotton ties 7.7	Sto	8.25
No. 2 light 4.5	0 to	5.00
Wrought turnings 7.2	5 to	
Cast borings 6.2	5 to	6.75
Machinery, cast		
Malleable8.7	5 40	9.25
Grate bars	0 to	6.50
Stove plate 8.0	0 10	
Cast iron car wheels	E 40	12.00
Cast iron car where	2 (0	Lin. UU

# Cincinnati

CINCINNATI, OHIO, July 10, 1912.—(By Telegraph.)

Pig Iron.—Producers in the South, as well as in the Hanging Rock district, are very much encouraged over the outlook for the last half of the year. While new business is yet scarce, there is a slightly better inquiry and shipments on old contracts are going forward at a very satisfactory rate. From both producing districts named there is reported a steady decline in stocks on hand. Quotations on Southern iron are

more stable and with the exception of a small lot of speculative iron, it is very improbable that any thing better than \$11.25 for No. 2 foundry, Birmingham basis, can be done for prompt shipment. The majority of southern furnaces are asking \$11.50 for the third quarter and three large producers have set \$12 as a minimum for fourth quarter delivery. Northern No. 2 foundry is firm at \$13.50 Ironton, for any delivery this year, but one leading furnace operator whose order books are well filled, has established a minimum of \$13.75 for fourth quarter business. The central Indiana inquiry for 600 to 900 tons of thixed Northern and Southern grades is yet to be closed, and a northern Indiana melter is expected to purchase 1000 tons of Southern No. 3 foundry iron for last half before the week ends. A Southern Ohio manufacturer wants 500 tons of Northern foundry iron, and there are a number of smaller inquiries from central Western consumers for smaller tonnage. Among sales reported is one more stable and with the exception of a small lot of ber of smaller inquiries from central Western consumers for smaller tonnage. Among sales reported is one for over 2000 tons of Southern foundry iron to a central western manufacturer for last-half shipment. A Michigan consumer took 1200 tons of special iron for this year's delivery. Both Lake Superior and Southern charcoal irons are in better demand. Five hundred tons of the former were taken by a Michigan firm for last-half movement, and 1000 tons of Southern charcoal was bought by an Eastern concern through a local agency. Based on freight rates of \$3.25 from Birmingham and \$1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry and 1 soft\$15.00 to \$1 Southern coke, No. 2 foundry and 2 soft 14.75 to 1	
Southern coke, No. 3 foundry	
Southern coke, No. 4 foundry	
	7.70
	4.70
	4.45
	25.50
Lake Superior charcoal 16.75 to 1	17.25

#### (By Mail)

Coke.—The difficulty in getting labor has caused a large curtailment in output, and leading 48-hr. brands are now quoted for either spot, or last half shipment, around \$2.40 to \$2.50 per net ton at oven, and a few interests are holding out for \$2.60. The reports from the Wise County and Pocahontas fields indicate that operators are also suffering from lack of labor, and furnace coke is obtainable around \$2 to \$2.25 per net ton at oven, the first-named figure for prompt shipment. Foundry coke is moving rather slowly and the bulk of orders booked are only carload lots to fill in. A few leading Pocahontas and Wise County brands are quoted around \$2.25 to \$2.50, but Connellsville operators are holding out for \$2.50 to \$2.75 per net ton at oven. No contracts of any size for either furnace -The difficulty in getting labor has caused a at oven. No contracts of any size for either furnace or foundry coke have been made in this section, with the exception of one sale of 10,000 tons of 48-hr. coke to a central Ohio gas producer.

Old Material.—The demand for all kinds of scrap material is very light in this territory just now, and the bulk of business reported by dealers is from outside customers. In spite of this a slight advance is registered in a few of the different kinds of scrap. The minimum figures given below represent what buyers are willing to pay for delivery in their yards in southern Ohio and Cincinnati, and the maximum quotations are dealers' prices f.o.b. at yards:

Per Gross Ton.   \$9.00 to Old iron rails   12.75 to Relaying rails, 50 lb. and up   20.00 to Rerolling steel rails   11.00 to Melting steel rails   10.00 to Old car wheels   12.25 to Old car wheels   12.25 to Old	\$9.50 13.25 21.00 11.50 10.50 12.75
Per Net Ton.	
No. 1 railroad wrought\$10.50 to	\$11.00
Cast Durings 6.25 to	6.75
Steel turnings 7.00 to	
No. 1 cast scrap	11.75
Burnt scrap 7.50 to	8.00
Old iron axles 16.50 to	17.00
Locomotive tires (smooth inside)	12.25
ripes and nues 700 to	7.50
Malleable scrap	9.00
Railroad tank and sheet scrap 6.50 to	7.00

Material.—Specifications reviously signed are coming in at such a lively rate that many mill agencies report it almost impossible to meet the demands of their customers. This is especially true with those rolling structural material. While new business being booked is of a minor nature just now, many large contracts are in sight that are expected to be placed within the next 30 days. Reinon contracts

forcing concrete bars are in excellent demand. Hoops and bands are about holding their own. Railroad track material shows considerable improvement, but wire nails are sluggish sellers. On account of the high prices of spelter the local manufacturer of galvanized these has made an advance of \$2 per ton and it is even sheets has made an advance of \$2 per ton, and it is pre-dicted that manufacturers in other districts will be compelled to mark up their prices for the same reason. Steel bars are firm at 1.25c., Pittsburgh basis, and structural plates and shapes at 1.30c. Warehouse prices remain around 1.65c. to 1.70c. for steel bars and structural material is quoted at 1.75c. to 1.80c.

# Birmingham

BIRMINGHAM, ALA., July 8, 1912.

BIRMINGHAM, ALA., July 8, 1912.

Pig Iron.—The first considerable amount of Birmingham pig iron sold for fourth quarter delivery was made this week, when one large interest sold 7,000 tons. The plants to which delivery is to be made are scattered. Small lots for immediate delivery have brought \$11.50 for No. 2. It is claimed in Birmingham that Southern iron said to have been sold in competitive points at lower than Birmingham quotations was other than Birmingham make. Production will be probably increased this month, The small Woodward furnace blown out has been replaced by one of the larger ones. Ironaton furnace has blown in and one at Vanderbilt is going in. For the six months of this year Alabama's iron output is 890,000 tons, an increase of 80,000 tons over the same period of 1911, which showed a minimum output. Only one Alabama concern has stocks on hand and they have dwindled to a quantity that does not affect the price. The lowest quotation for future delivery heard this week was \$11.75 on certain grades under standard. Some orders for iron for Italy at good prices have been obtained, but are said to depend upon the securing of ship room. Last week's quotations are continued as the minimum for spot delivery. They are f.o.b. Birmingham as follows: ham as follows:

No. 1 foundry and				
No. 2 foundry and				
No. 3 foundry				
No. 4 foundry				
Gray forge	 	 	 10.50 to	10.75
Basic				
Charcoal iron	 	 	 22.50 to	23.00

Cast Iron Pipe.—There is no change in the pipe situation. Shipments are equal to production and there are no yard accumulations. The prospect is one of continuous operations for months to come with the new plant at Holt coming in soon. Prices f.o.b. cars

continuous operations for months to come with the new plant at Holt coming in soon. Prices f.o.b. cars Birmingham are as follows: 4 in., \$24; 6 to 8 in., \$22; to in. and up, \$21.50, with \$1 extra for gas pipe.

Coal and Coke.—Coke is in fair demand at the prevailing prices, \$3.25 to \$3.75 per net ton at oven. Increased furnace capacity may strengthen the coke market soon. Inquiries and orders for steam coal are more active. Summer operations will be more than normal and the autumn prospect is very good.

Old Material.—The week's business in old material has not been noteworthy. It has consisted principally of small lots of cast and wrought scrap. Stocks on hand are not large and prices, quoted by local dealers, continue as follows, f.o.b. dealers' yards:

Wrought iron car axles	\$15.00 to \$16.00
Old steel axles	13.30 10 14.50
Old iron rails	
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	10.00
No. 1 country wrought	8.50 to 9.00
No. 2 country wrought	8.00 to 8.50
No. 1 machinery	9.00 to 9.50
No. 1 steel	10.00 to 10.50
Tram car wheels	
Standard car wheels	11.50 to 12.00
Light cast and stove plate	8.00 to 8.50

## St. Louis

St. Louis, Mo., July 8, 1912.

There has been a very definite improvement in the feeling in this market. No large new business has appeared but there are evidences of an increase in the disposition to buy and willingness to pay the prices

Pig Iron.-The forward movement is keeping consumers well up with contract requirements and ahead of them in many instances. There is a definite demand for quick shipment on specifications, showing that actual consumption is good. No large new inquiries are in the market, but sales of small lots have been on the increase, running up to a good aggregate. Several sales increase, running up to a good aggregate. Several sales of 200 and 500-ton lots and one of 1000 tons are re-

None of the large interests is willing to consider last quarter business except as a favor to a customer and the price is strongly held at \$12 in such cases for No. 2 Southern, Birmingham basis. Northern iron is \$13.50 for No. 2 foundry and malleable, Ironton basis, while No. 2 X Chicago and malleable are \$14.50 per ton.

Coke.-Movement on contract is excellent, but new business is not noticeable, practically all requirements being covered by contract. There has been no recent movement of by-product coke and no quotation, therefore, based on sales. The asking price is not changed from last report.

Finished Iron and Steel.—No large new business is to be reported aside from 1150 tons to the Indiana Bridge Company for the Anheuser-Busch Brewing Association and 450 tons to the Stupp Works for an addition to the Scullin-Gallagher Steel Company. Generally the reports are that contracts expiring July I have been fully specified and in some instances exceed contracts. Those having contracts are in cases paying contracts. Those having contracts are in cases paying the present market price to secure delivery, though even the present market price to secure delivery, though even at this, deliveries are four to six, weeks away on orders of even this type. In standard rails there is no new business to report this week. Plates are no easier to get than at last report and the new prices have not lessened the demand. Light rails are in fair request from the coal interests. Track fastenings are heavily specified up to capacity and deliveries are growing more extended. The specifications for the structural iron and steel for the new Commonwealth Trust Building, being prepared by Eames & Young, are expected out in a short time. About 6000 tons, it is expected, will be required. be required.

Old Material.—The scrap market is active for steel, but little iron is moving. The steel mills are taking about all that appears suited to their needs, but the iron scrap is being shipped to other markets, the quotations being about on a parity, plus freight rates. Re-laying rails have shown exceptional activity and have been marked up. We quote dealers' prices, f.o.b. St. Louis, as follows:

U	dis, as follows.	
	Per Gross Ton.	
	Old iron rails	
	Old steel rails, rerolling 12.00 to 12.50	
	Old steel rails, less than 3 ft 12.00 to 12.50	
	Relaying rails, standard section, subject to	
	inspection	
	Old car wheels 13.50 to 14.00	
	Heavy melting steel scrap 11.00 to 11.50	
	Frogs, switches and guards cut apart 11.00 to 11.50	
	D - N - T -	
	Per Net Ton.	
	Iron fish plates\$12.00 to \$12.50	
	Iron car axles 17.00 to 17.50	
	Steel car axles 15.50 to 16.00	
	No. 1 railroad wrought 12.00 to 12.50	
	No. 2 railroad wrought	
	Railway springs 10.00 to 10.50	
	Locomotive tires, smooth 12.00 to 12.50	
	No. 1 dealers' forge 8.00 to 8.50	
	Mixed borings 6.25 to 6.75	
	No. 1 busheling 9.00 to 9.50	
	No. 1 boilers, cut to sheets and rings 7.50 to 8.00	
	No. 1 cast scrap 10.50 to 11.00	
	Stove plate and light cast scrap 8.00 to 8.50	
	Railroad malleable 9.50 to 10.00	
	Agricultural malleable 8.00 to 8.50	
	Pipes and flues 7.50 to 8.00	
	Railroad sheet and tank scrap 7.50 to 8.00	
	Railroad grate bars 8.50 to 9.00	
	Machine shop turnings 7.00 to 7.50	

# Buffalo

BUFFALO, N. Y., July 8, 1912.

Pig Iron.-Sales have been light. Furnaces are so Pig Iron.—Sales have been light. Furnaces are so well sold up, however, that the apparent slackening in interest on the part of consumers is not bothering them as the stock available for new sales is not large and current shipments on existing contracts are very heavy. In fact iron is being forwarded each day up to present productive capacity. The price situation is holding very firm, there being no change in schedules except for malleable and basic, on which some furnaces are quoting 25c. per ton higher. We quote as follows for third and fourth quarter delivery f.o.b. Buffalo:

No. 1X foundry	\$14.25 to \$14.75
No. 2X foundry	14.00 to 14.25
No. 2 plain	14.00
No. 3 foundry	13.75 to 14.00
Gray forge	13.50 to 13.75
Malleable	
Basic	14.25 to 14.75
Channel according to brand and analysis	n 15 75 to 17 50

Finished Iron and Steel.—Specifications continue to come forward in good volume for all lines of finished products and numerous sales of bars and plates have been made at the new prices, evidencing the fact that purchasers believe the new schedules are to be firmly upheld and perhaps further increased. Customers not

under contract are endeavoring to obtain as long period contracts as possible, feeling that there is a probability of a further rise in price. The week has period contracts as possible, feeling that there is a probability of a further rise in price. The week has shown active inquiry from car builders for plates and shapes. Prices on bars, plates and shapes are very firm and in some instances premiums have been paid for prompt deliveries. The advance of \$2 per ton on merchant pipe for 7 in. and over has stimulated buying in the larger sizes. Business in wire products is very satisfactory for the season, consumers ordering ahead to some extent, owing apparently to rumors of a buying in the larger sizes. Business in wire products is very satisfactory for the season, consumers ordering ahead to some extent, owing apparently to rumors of a further price advance. Blue annealed sheets have advanced \$1 per ton and prices for tin plates are firmly held at \$3.50. In fabricated structural lines business is active and a good many building projects are developing. Architect G. Morton Wolfe has completed plans for an addition to the factory of the U. S. Hame Company, Buffalo, and figures are being taken for the 500 tons of steel required. Plans are being prepared for a large warehouse and freight terminal on Buffalo River. For the recently organized Buffalo Terminal Warehouse 1400 tons of steel will be required. Figures are soon to be taken for the Hippodrome theater building, Buffalo, to be erected by the Shea Amusement Company, requiring about 800 tons. Bids go in the middle of this week for an office and theater building for Cahill Brothers, Syracuse, N. Y., from plans of Architects Randall & Merrick calling for 500 tons; for steel for the baseball cage on Cornell University campus at Ithaca, 200 tons; the latter part of the week and on July 15 for the Hutchinson High School, Buffalo, from revised plans by Architect H., Osgood Holland, 600 tons. Revised plans are being prepared for the Queen City Improvement Company's store building, Buffalo, calling for 400 tons of steel. Bids will soon' be received for factory and warehouse extension for the Wm. A. Rogers Co., Ltd., Niagara Falls, N. Y., 200 tons. The Lackawanna Bridge Company, Buffalo, has taken bridge contracts for the Utica & Mohawk Valley Traction Company and for the Lake Shore Railroad near Cleveland, aggregating about 400 tons. road near Cleveland, aggregating about 400 tons

Old Material.-The market continues dull with no perceptible improvement in local demand, consumers buying from hand to mouth for immediate requirements only. Some few shipments are being made to eastern Pennsylvania and Pittsburgh districts, but such transactions are also small, chiefly confined to carload lots. There is no quotable change in prices, which are as follows per gross ton f.o.b. Buffalo:

Heavy melting steel\$12.75 to \$	13.25
	16.00
No. 1 railroad wrought 14.00 to	14.75
No. 1 railroad and machinery cast scrap 13.50 to	14.00
Old steel axles 16.50 to	17.25
Old iron axles 21.00 to	21.50
Old car wheels 12.75 to	13.25
Railroad malleable 11.50 to	12.25
Boiler plate, sheared 13.75 to	14.25
Locomotive grate bars 11.00 to	11.25
	10.00
	10.25
	8.50
the confine and and post reces the confine to the c	7.50
Clean east borings 7.25 to	1.00

## The German Iron Market

## Signs of Cessation of the Boom

Berlin, June 27, 1912.

Berlin, June 27, 1912.

It cannot be denied that a certain feeling of doubt about the persistence of the present boom in the iron trade is increasing in some quarters. Price advances are unquestionably growing rarer. This week only two cases can be reported. The Bavarian group of the Association of German Foundries has just voted to raise castings I mark per 100 kg., and the Rhenish-Westphalian Bandiron Works have now made the expected advance in that specialty; but this increase is only 2.50 marks per ton, not 5 marks as had been looked for. Another indication of the doubt is found in the pricecutting in the steel bar trade, which was referred to last week. These offers of dealers range between 117.50 and 118.50 marks; and it is admitted this week that buyers have not been tempted to abandon their attitude of reserve even at these reduced prices. The movement of iron shares on the Berlin Bourse this month clearly reflects the misgivings of the speculative classes. clearly reflects the misgivings of the speculative classes. At the May settlement the average price of the ten leading iron shares dealt in here was 176.85 marks; but the quotations for the June settlement as fixed to-day

yield an average of 173.47 marks, a drop of 3.38 marks.

The feeling of uncertainty has been somewhat increased by the latest news from the Belgian market.

Several days ago a drop in the export price of bars

and plates of is. was reported. A trade review by a Brussels correspondent of one of the Berlin newspapers says that plates have been reduced i to 2s. On the other hand, this correspondent states that the upward tendency of prices in the home market has continued.

The general situation of the German trade has hardly The general situation of the German trade has hardly undergone any change. From the pig iron trade calls for delivery of goods on order are extraordinarily brisk. From the Siegen district dullness in scrap is mentioned. While the bar steel market is described as quiet there, it is added that the mills are as busy as ever, and there is great activity in plates and sheets. In the Silesian market for rolling mill products calls, for delivery are so brisk and so urgent that new orders cannot be accommodated under 12 to 16 weeks. This state of things has continued for months already. The greatest activity prevails in hand iron and in small hars

state of things has continued for months already. The greatest activity prevails in band iron and in small bars, which are regularly supplied by that district in large quantities to the lower Danubian countries and Turkey. The Adolf-Emil-Hütte, which is the name of Gelsenkirchen's new establishment at Esch, in Luxemburg, has now blown in its sixth furnace, which means that the whole battery has been put into operation since the first of March. From the same place it is reported that the Hüttenwerk Collart is planning the erection of two new furnaces.

While no details as to changes in allotments in connection with the renewal of the international steel rail pool have been given to the public, it is reported upon excellent authority that the German works got an increase that takes account of their enlarged producing capacity. It is not mentioned whether this increase was obtained at the expense of any other country. It is interesting to note that the Steelworks Union has just taken an important decision looking toward placing it in closer business relations with foreign markets. One of its directors, Herr Gussmann, it was announced today, is to spend most of his time abroad looking after the interests of the Union and pushing the sales of German steel. He will give, apparently, special attention to the rail trade.

## Germany's Increase in Exports

Germany's exports of iron and steel of all kinds during the first five months of this year amounted to 2,413,000 tons, as compared with 2,072,800 tons for the corresponding months of 1911. Imports amounted to 268,700 tons, against 240,000 tons; and the excess of exports over imports was 2,144,000 tons, against 1,832,-

Exports by classes were as follows:

Exports of		y-May. 1912.
Pig iron Old and scrap material. Semi-finished steel Beams Other structural forms Plates, thicker than 5 mm Plates, thinner Rough wire. Polished wire. Wire nails Piping Steel rails Steel ties, etc. Rolling material	329,348 73,071 244,263 134,008 307,262 111,01 42,135 84,890 54,584 23,274 54,373 218,739 57,183 34,531	441,261 60,261 263,650 181,691 340,522 122,932 52,686 106,446 64,101 22,088 61,296 237,110 77,975 46,837

LATER, June 28.—According to a dispatch of yesterday from Esch an advance of 5 francs per ton in all semi-finished steel has just been made in eastern France. The reference is apparently to the Briey district.

## New York

NEW YORK, July 10, 1912.

Pig Iron.—This week started off with a very light demand for pig iron. No inquiries for any large amount are now before local sellers. A radiator interest has made some purchases for a Connecticut plant, the total being probably 800 to 1000 tons and thus not as large as has been reported. The buying for a soil pipe company in the New York district has amounted to about 4000 tons. Eastern Pennsylvania furnaces appear to be holding firmly for \$15 at furnace for No. 2X, and one company is asking 50 cents higher, but the \$15 price has not been established thus far by anything beyond moderate lots. A quiet market is looked for in the next two or three weeks, though there are a number of foundry companies that may be inquiring by the end of the month. The basic iron transactions in eastern Pennsylvania are estimated at close to 10,000 tons, including 1000 tons of off basic for prompt delivery—iron that would ordi-

narily be taken by the pipe companies. The basic taken in the above transactions for fourth quarter delivery went at \$15.50 delivered. Foundry operations are at about the same rate as in recent months and melters generally are taking their iron as fast as called for in their contracts. The market may still be quoted as follows for Northern iron at tidewater: No. 1 found-dry, \$15.75 to \$16; No. 2X, \$15.50 to \$15.75; No. 2 plain, \$15 to \$15.25. Southern iron is quoted at \$15.75 for No. 1 foundry and \$15.25 to \$15.75 for No. 2 foundry. Finished Iron and Steel.—Views regarding condi-

tions are somewhat mixed with a preponderance of helief that business will be very satisfactory for six or nine months at least. What signs of slight pessimism nine months at least. What signs of slight pessimism there are indicate a fear of the outcome of the national elections. Less is heard of possible price advances and these are put off until September. One remarkable development is an advance to a price of 1.35c., Pittsburgh, for plates by an important Eastern mill, which closed on 1100 tons on this basis for delivery five or six weeks hence. Some interests seem to be following a programme of allowing competitors to take busing a programme of allowing competitors to take busing a six weeks hence. Some interests seem to be following a programme of allowing competitors to take business at present prices until, with a continued inflow of new orders, these competitors will be filled up to that extent that those now holding off will be able to close easily at more profitable prices. The volume of business continues large but the prominent feature of the market still is the question of deliveries. No new large developments in the structural field have occurred but quite a little business has been closed; nor have the numerous rumors of large car orders maoccurred but quite a little business has been closed; nor have the numerous rumors of large car orders materialized, such as those credited to the Boston & Maine, the Pennsylvania, the Norfolk & Western and the Kansas City Southern. The George A. Fuller Company has contracted to demolish the ruins of the Equitable Building, which fact marks a step toward the sale of the site and toward the erection of a probably large building. The activity in railroad lines is still Equitable Building, which fact marks a step toward the sale of the site and toward the erection of a probably large building. The activity in railroad lines is still definite as shown by an inquiry from a large railroad for 6000 tons of rails to be delivered within a month. The urgency of general business is also indicated in the action of a buyer who had a contract giving him the opportunity to secure 100 tons of material at the I.15c., Pittsburgh, basis. For 50 tons of this material a premium of \$7 a ton was paid for prompt delivery, which arrangement was met by the mill, though unattractive to it, by rolling the steel in an iron plant. Of the Chesapeake & Ohio pier work at Newport News it is understood that about 5500 tons have gone to the Pennsylvania Steel Company and 800 tons to the Virginia Bridge & Iron Company, and tanks for the railroad amounting to 200 tons are to be furnished by the Des Moines Bridge & Iron Company. Other awards in the structural field include 600 tons to the Fort Pitt Bridge Company for bridges for the New York Central; 400 tons to the American Bridge Company for the Pennsylvania at Rahway, N. J.; 1000 tons for the Loft candy factory to the Radley Steel Company; 200 tons for the Philadelphia & Reading Bridge Company to the Phoenix Bridge Company; 300 tons for the Title Guaranty & Trust Company, Baltimore, to Lauer & Harper; 500 tons for an apartment house, Townsend Holding Company, West End avenue, New York, to the Lehigh Valley Structural Company; 300 tons for a tobacco factory at Richmond to the Chesapeake Iron Works; 200 tons for bridge superstructure in Baltimore to Lewis F. Shoemaker & Co. It is understood also that considerable of the terminal area work for the New York Central, involving perhaps 3000 tons, has also been closed. In addition to the pending work New York Central, involving perhaps 3000 tons, has also been closed. In addition to the pending work may be mentioned 2500 tons for Philadelphia & Reading track elevation in Philadelphia and the future has store perhaps 350,000 tons in connection with New rk subway work and the third tracking of some of New York elevated lines. In car business the New the New York elevated lines. In car business the Harriman lines have probably closed on 3000 cars, exercising an option taken when cars were purchased a few months ago; it is believed that the Duluth, South Shore & Atlantic has closed on 1000 cars. The Virginian Railroad is still in the market for 750 cars; the Denver & Rio Grande for 1200 and the Grand Trunk has inquired for 2000 cars. Quotations are: Steel bars, 1.41c. to 1.46c.; plain structural material and plates, 1.46c. to 1.51c.; bar iron, 1.32c. to 1.37c., all New York. Plain material from store, 1.80c. to 1.90c.

Cast Iron Pipe.—There is an absence of public lettings, but as was true last week private buying still continues with the demand specially for the smaller sized pipe. Prices are notably firm and carload lots of 6-in. continue at \$22 to \$23 per net ton, tidewater.

Old Material.—Consumers have had little to do

with the scrap market in the past week. One eastern Pennsylvania steel company that had asked for the holding up of shipments pending inventory and repairs in the first few days of the month resumed the receipt of material, but there has been little increase in activity in heavy melting steel due to new buying. Prices for such scrap are maintained, however, and the weakness which appears in old material in one or two measures. ness which appears in old material in one or two markets, particularly Chicago, is not in evidence here. Almost nothing is done in cast scrap, and rolling mills are but little better buyers. Dealers' prices, per gross ton, New York and vicinity, are quoted as follows:

Old girder and T rails for melting \$10.75 to \$11,	28
Heavy melting steel scrap 10.75 to 11.	0.0
Relaying rails	
Rerolling rails (nominal) 12.50 to 13.	00
Iron car axles 20.50 to 21.	00
Old steel car axles	50
No. 1 railroad wrought	75
Wrought iron track scrap 12.00 to 12.	
No. 1 yard wrought, long 11.50 to 12.	
No. 1 yard wrought, short 10.75 to 11.	
Light iron 5.00 to \$	
Cast borings 7.00 to 7.	25
Wrought pipe 10.00 to 10.	
Old car wheels 13.00 to 13.	50
No. 1 heavy cast, broken up 11.00 to 11.	50
Stove plate 8.25 to 8.	50
Locomotive grate bars 8.75 to 9.	
Malleable cast 10.00 to 10.	

Ferroalloys.—Ferromanganese is showing some activity at \$48.50, Baltimore, for 80 per cent. material with nearly all of the business for delivery in the first half of 1913. While the premium recently demanded half of 1913. While the premium recently demanded on spot ferromanganese has all but gone, sales of one or two carloads were made in the last week at \$50. Inquiries representing future requirements ranging from 300 to 1000 tons are before the trade. It is reported that German ferromanganese recently imported has been offered at less than \$48.50, but New York representatives of the trade sav the reports are unconfirmed. For 50 per cent. ferrosilicon, \$72.50 Pittsburgh continues to be the price, with \$71.50 asked for 100 tons, all for this year's delivery.

# Depleted Stocks of British Pig Iron

Speculative Advance in Iron Not Held -- Some Furnaces Gaining On Orders

(By Cable.)

MIDDLESBROUGH, ENGLAND, July 10, 1912. Cleveland pig-iron is lower, under the influence of speculative realizations and a panicky copper market, but fundamental conditions remain good though some furnaces are beginning to catch up with their arrears. Connal's stores are 305,559 tons, against 310,127, 313,693 and 328,430 tons for the preceding three

Semi-finished material is firm with indications that large business is about to be released. The result of the Birmingham quarterly meeting Thursday is expected to

give buyers a lead. Finished steel is firm.
We quote as follows: Cleveland pig iron warrants (closing Tuesday), 56s. 21/2d., against 56s. 91/2d. one week

No. 3 Cleveland pig iron, maker's price, f.o.b. Middlesbrough, 56s. 9d, a decline of 6d. in the week.

Steel sheet bars (Welsh) delivered at works in Swan-Valley, £5 178. 6d.

German 2-in. billets, f.o.b. Antwerp, 100s. German basic steel bars, f.o.b. Antwerp, £5 17s. Steel bars, export, f.o.b. Clyde, £7 15s.

Steel joists, 15-in. export, f.o.b. Hull or Grimsby, 16

Steel ship plates, Scotch, delivered local yard, £7, 178. 6d. Steel black sheets, No. 28, export, f.o.b. Liverpool, to 28. 6d.

Steel rails, export, f.o.b. works port, £6 7s. 6d. to £6 10s. Tinplates, cokes, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 14s. 7½d., October-December.

Move to Buy American Iron-Negotiating for 50,000 Tons American Plates

(By Mail.)

MIDDLESBROUGH, June 29, 1912. Judging from the course of events in the leading grade of pig iron, No. 3 Cleveland foundry, we are in the full swing of a boom. On two recent days prices actually rose a shilling with a wild whirl of buying and of course now that prices begin to look pretty high, the cheerful optimist is predicting the attainment of figures not seen since 1890 when 78s. 3d. was recorded. Although the movement upward has certainly taken people unawares and although its basis was undoubtedly speculative it must not be over-looked that actual trade conditions are very good and that the whole basis is the outcome of the wholly exceptional labor dislocation in the coal trade which shut off production. It is a fact that even now there are idle furnaces and furnaces working badly, while it may be taken as a literally accurate statement that outside of the ever diminishing quantity of pig iron held in the public warehouses there is not a ton of unsold stock in the yard of any furnacemen from one end of the country to the other. The scarcity of Lincolnshire, Derbyshire, Northampton-shire and Lancashire irons, to name only the products of a few of the Midland districts, is very acute and in order to keep themselves going, the local consumers have been enforced to go outside to supplement their supplies. only place where iron was to be got for love or money was Connal's store at Middlesbrough. Coincidently some of the big foreign buyers have been drawing heavily on our reserves and stocks in consequence mark a more or less substantial reduction from day to day. It is generally believed, and there are firm grounds for the belief too, that lots of iron must yet disappear from our already attenuated stock and the fear lest the position may become really dangerous is clearly manifested by the endeavors which are being made by buyers to cover themselves for very far ahead but they invariably find that sellers are reluctant if not entirely unresponsive to the overtures made to them. So far as pig iron is concerned there is very little present prospect of foreign supplies becoming available although one of our big steelworks is putting proposals for a big tonnage before some American furnace owners, hardly, it would seem, with any hope of business

That American steel men are resolved to maintain a footing in the export markets is becoming more apparent month by month and the ceaseless efforts of the independent works to cultivate business relations with British users of their products is highly significant. Fair quantities of slabs and other semi-finished steel product have been sold by independent Bessemer and open-hearth plants and inquiries for some additional lots are under consideration. In one case, where the potential buyer, a few weeks back, would not raise his limit and abstained from purchasing, he is now bidding more than the seller then asked.

There is the chance of some important business maturing. The Verband, who for weeks have been entirely out of the market as regards sheet bars, are now back again but they ask 105s. f.o.b. Antwerp, and have nothing earlier to dispose of than December shipment.

A very heavy constructional programme is before the shipbuilders and it is quite on the cards that a big tonnage of ship plates may be placed with American steel mills who already are considering a 50,000 ton line.

## Chicago

CHICAGO, ILL., July 9, 1912.

An additional evidence of the strength of the market in all lines of finished material was presented by the uniform action July 1 of all mills in declining to carry over unspecified tonnage except at the advance of \$1 a ton and further by the fact that little or no tonnage was canceled. The crowded mill situation is unchanged and instead of the usual shut down at this time the local mills were down on July 4 only or at most for the last three days of the week. Premiums are easily obtainable where prompt deliveries can be offered and jobbers are being flooded with orders for material from stock. The scarcity of common labor is everywhere a serious handicap with no remedy in sight until the season of out-of-doors contracting is past or the returning tide of immigration relieves the famine. Further strengthening of prices is show in the advance of bar iron to 1.35c. and of blue annealed sheets to a minimum of 1.63c. and black sheets to 2.18c. Rail sales reported incude two orders for 10,000 tons each and inquiries for 12,000 tons additional are noted. The buying of pig iron is more or less general over the entire territory and while conservative in character aggre-

gates a considerable tonnage. The scrap market continues weak in the absence of demand for prompt shipment material by melters.

Pig Iron.—For fourth quarter shipment \$12 is now being asked by Southern furnaces for No. 2 iron although \$11.50 can still be done and very readily for last half shipment. Sales for fourth quarter at the higher quotation, amounting to at least 3000 tons, are noted, while a number of other orders for last half delivery were placed. The volume being taken by local furnaces from melters who earlier thought their requirements fully covered grows surprisingly and is doubly satisfactory because of the entire absence of any speculative feature in the buying. The price of local iron continues to be \$14.50 at the furnace, the influence of Ohio furnace quotations preventing an advance which local conditions might otherwise justify. We quote local irons, f.o.b. furnace, the average switching charge to Chicago foundries being nearly 50c. per ton. Other quotations are for Chicago delivery on prompt shipments as follows:

Lake Superior charcoal\$16.25 to	\$16.75
Northern coke foundry, No. 1	15.00
Northern coke foundry, No. 2	14.50
Northern coke foundry, No. 3	14.25
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft 16.10 to	16.35
Southern coke, No. 2 foundry and No. 2 soft 15:60 to	15.85
Southern coke, No. 3 15.35 to	15.60
Southern coke, No. 4	15.10
Southern gray forge 14.35 to	14.60
Southern mottled	13.85
Malleable Bessemer	14.50
Standard Bessemer	16.75
Basic	14.50
Jackson County and Kentucky silvery, 6 per cent	17.40
Jackson County and Kentucky silvery, 8 per cent	18.40
Jackson County and Kentucky silvery, 10 per cent	19.40

Rails and Track Supplies.—Local mills are understood to have taken orders for 10,000 tons of rails each from the Canadian Pacific and Grand Trunk Railroads, while inquiries for 12,000 tons for which fairly prompt delivery is asked are in the market. Local mills are scarcely able to offer attractive shipping dates and some of the eastern mills, such as at Sparrows Point or Buffalo, seem likely to secure the business notwithstanding the freight disadvantage. Light rail sales show some improvement and spike and bolt orders are exceeding makers' capacity. Tie plate orders this year have greatly exceeded previous purchases and the larger western roads have made purchases aggregating fully 75,000 tons. We quote standard railroad spikes at 1.60c. to 1.70c., base; track bolts with square nuts, 2c. to 2.10c., base, all in carload lots, Chicago; standard section Bessemer rails, Chicago, 1.25c., base; open hearth, 1.34c.; light rails, 25 to 45 lb., 1.20c. to 1.25c.; 16 to 20 lb., 1.25c. to 1.30c.; 12 lb., 1.30c. to 1.35c.; 8 lb., 1.35c. to 1.40c.; angle bars, 1.50c., Chicago.

Structural Material.—Fabricated contracts placed during the past week were unimportant and did not total more than 1500 tons. The American Bridge Company will furnish 289 tons for the Orpheum Theater, Salt Lake City; Wendnagel & Co. 296 tons for the Lanski Theater, Chicago; the Modern Steel Structural Company, 627 tons for a bridge for the Cedar Rapids & Iowa City Railway Company and the Pennsylvania Steel Company, 306 tons for the Government Lock Gate No. I between Minneapolis and St. Paul. No new car orders of importance are noted but several inquiries for locomotives including 50 for the Illinois Central are in the market. Mill deliveries on structural material are not being promised by local interests before October. For Chicago delivery we quote from mill for plain shapes, 1.48c. and from store 1.80c.

Plate.—Mill conditions as regards plates parallel those obtaining with regard to shapes. Because of deliveries and the more favorable prices, plate business in material less than ½ in. is being taken out in blue annealed sheets, a condition applicable to a wide range of light plate working shops. We quote for Chicago delivery mill shipment, 1.48c. and from store 1.80c.

Bars.—While it can not be said that bar-iron quotations as low as 1.30c. Chicago have entirely disappeared, the mills have no difficulty in obtaining \$1.35 and numerous sales at this price have been made. The Tudor mill of the Republic Iron & Steel Company at St. Louis has been shut down indefinitely and a number of the employees transferred to East Chicago. Just what disposition will be made of this mill has not been announced, but the withdrawal of this capacity is a strengthering influence in the market already apparent. Steel bar conditions are unchanged. We quote as follows: Bar iron, 1.30c. to 1.35c.; hard steel bars, 1.30c.;

soft steel bars, 1.43c., and from store, soft steel bars,

Sheets.—Quotations on sheets, both blue annealed and black, show the effects of slowly developed tendencies toward strength and former maximum prices are now minimum figures. The volume of business is undiminished. We quote, Chicago delivery, as follows: (arload lots, from mill, No. 28 black sheets, 2.18e.; No. 28 galvanized, 3.18c.; No. 10 blue annealed, 1.63c. Prices from store are: No. 10, 1.95c.; No. 12, 2c.; No. 28 black, 2.5oc., and No. 28 galvanized, 3.6oc.

Rivets and Bolts.—There is a very fair volume moving in the rivet and bolt trade, and manufacturers are pursuing conservative selling programmes preceding the large increase in manufacturing capacity that has been finished or planned for this territory. Contracts are being specified against promptly and prices are firm. We quote as follows: Carriage bolts up to ½ in. x 6 in., rolled thread, 80 and 15; cut thread, 80 and 7½; larger sizes, 75 and 7½; machine bolts up to ¾ in. x 4 in., rolled thread, 80 and 20; cut thread, 80 and 12½, larger sizes 75 and 12½; coach screws, 80 and 20; hot pressed nuts, square head, \$6.30 off per cwt.; hexagon, \$7.10 off per cwt. Structural rivets, ½ in. and larger, 1.78c. base, Chicago, in carload lots; boiler rivets, 0.10c. additional, Rivets and Bolts .- There is a very fair additional.

additional.

Cast Iron Pipe.—Municipal specifications for castiron pipe involving any considerable tonnage continue scarce, but routing tonnage is normally large. The award of 1500 tons of pipe at Cincinnati has been carried over and in addition that city will be in the market for 2000 tons on July 11. At Moose Jaw, Saskatchewan an inquiry for 1250 tons is reported. We quote as follows, per net ton, Chicago: Water pipe, 4 in., \$27.50; 6 to 12 in., \$25.50; 16 in. and up, \$25, with \$1 extra for gas pipe.

Wire Products.—Prices for wire products have not

Wire Products.-Prices for wire products have not Wire Products.—Prices for wire products have not been advanced in step with advances in other lines of finished steel products, and with the passage of the midsummer period of dullness adjustments in this direction are prospective. We quote as follows: Plain wire, No. 9 and coarser, base, \$1.58; wire nails, \$1.78; painted barb wire, \$1.78 to \$1.83; galvanized, \$2.08; polished staples, \$1.83; galvanized, \$2.13, all Chicago.

Old Materials.-Both because the majority of scrap melters in this territory have provided themselves with stocks of old material sufficient for the requirements of 30 to 90 days and because of the shortage of labor for handling scrap readily, scrap for prompt shipment can be moved only with difficulty and with sacrifices in price. As a result the scrap market grows weaker as the finished material market becomes stronger. With the quantity of incoming scrap from railroads and as the finished material market becomes stronger. With the quantity of incoming scrap from railroads and country comparatively light, an adjustment of the present situation is not expected to be long delayed. The lists offered last week included about 4000 tons from the Chicago & Northwestern, of which 1000 tons of rails was the largest item, and 600 tons from the Wabash. We quote for delivery at buyer's works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton.
Old iron rails\$16.00 to \$16.50
Old steel rails, rerolling 13.25 to 13.75
Old steel rails, less than 3 ft 12.50 to 13.00
Relaying rails, standard section, subject to
inspection 24.00
Old car wheels 14.00 to 14.50
Heavy melting steel scrap 11.50 to 11.75
Frogs, switches and guards, cut apart 11.50 to 11.75
Shoveling steel
Steel axle turnings 9.50 to 10.00
P V T
Per Net Ton.
Tron angles and salis have \$12.75 to \$14.25

Steel axle turnings 9.50 to 10.00	
Per Net Ton.	
Iron angles and splice bars\$13.75 to \$14.25	
Iron arch bars and transoms 15.25 to 15.75	
Steel angle bars 11.25 to 11.75	
Iron car axles 19.25 to 19.75	
Steel car axles 15.50 to 16.00	
No. 1 railroad wrought	
No. 2 railroad wrought	
Locomotive tires, smooth	
Cast and mixed horings	
No. 1 busheling	
No. 1 boilers, cut to sheets and rings 8.50 to 9.00	
Boiler punchings	
No. 1 cast scrap	
Stove plate and light cast scrap 10.00 to 10.50	
Railroad malleable	
Agricultural malleable 10.50 to 11.00	
Pines and flues 9.00 to 9.25	

The two blast furnace stacks of the Poughkeepsie Iron Company, Poughkeepsie, N. Y., abandoned several years ago, together with the machinery, were sold as old material in the past week.

# Metal Market

NEW YORK, July 10, 1912.

## The Week's Prices

	Co	Cents Pe	r Pound for	Early	Delivery.	New	elter—
Jı	7	Electr	o- Tin, . New York.	New	St. Louis.	New York.	St. Louis.
8	17. 17. 17. 17. 17.	.62½ 17.50 .62½ 17.50 .50 17.37	45.20 44.50	4.75 4.75 4.75 4.75 4.75	4.67 1/2 , 4.67 1/2 , 4.67 1/2 , 4.67 1/2 ,	7.25 7.25 7.25 7.25 7.25	7.10 7.10 7.10 7.10 7.10

Copper is inactive in a market that is weaker, largely due to sales of the metal by second hands at lower prices. Tin is dull and lower in price. Lead is strong at higher prices. Spelter maintains its strength. Some brands of antimony have advanced.

## New York

Copper.—The copper situation is admittedly a puzzle even to those who follow it the closest. This week brought a sharp break and uncertain conditions in the London speculative market, which if continued must have added effect upon reducing the prices of copper as surely as they have had in advancing it, but American producers and selling agencies are evidently ignoring outside influences. The large holders of copper are adhering to their price of 17.75c., cash, New York, for Lake and 17.75c., thirty days delivered for electrolytic. Yet at the same time it is known that copper has sold as low as 17.20c. for alleged speculative lots of electroas low as 17.20c. for alleged speculative lots of electrolytic and it is asserted that large quantities of electrolytic can be had at 17.37½c. The reason for the attitude of the producers is that they have sold out for July and August delivery and partly for September, and inasmuch as their prices are nominal they can as well make them 17.75c. as lower. There is considerable September copper to be bought but the consumers who have been out of the market for some time are disinclined to come in during the present unrest. It is companied to that the tradescent unrest. It is companied to the that the producers and dealers will not september copper to be bought but the consumers who have been out of the market for some time are disinclined to come in during the present unrest. It is commonly believed that the producers and dealers will not get the prices they are now holding when it comes to supplying the September demand. The London excitement in speculative copper can be said to have started on the evening of July 8 when the metal closed there at \$475 16s. 3d. and opened on the morning of July 9 at \$472 12s. 6d. That same day there was a reaction to \$474 2s. 6d. followed by a further recovery this morning to \$475. Coincident with the activity in London in speculative market there has been a revival of the talk both here and abroad questioning the accuracy of the figures of the Copper Producers' Association, the June report of which is printed elsewhere in this issue and which shows a decrease of nearly 14,600,000 lb. in total deliveries and a decrease in stocks of about 5,000,000 lb. The price of copper in London to-day is \$75 for spot and \$475 17s. 6d. for futures. The exports of copper this month, which are under the normal, total \$6738 tons.

Pig Tin.—Of the tin market not a great deal can be said in the way of news. The metal appears to be apathetic in every phase, although it was thought that the first three days of this week would be busy because of the fact that there was little or nothing doing in the last three days of last week. The large quantity of tin which arrived on the Pottsdam from Rotterdam on July 3 and which was looked for with eagerness late in June, has not been absorbed as rapidly as has been expected. Dealers frankly admit that their business is very slow and the premium which has been asked for spot tin is rapidly vanishing. Tin is quoted to-day at \$4.62½c., having risen a few points on the strength of an advance in London. The price in London to-day is \$202 for spot and \$196 10s. for futures. The arrivals of tin this month have been 2469 tons and there is afloat 2102 tons.

Tin Plates.—There are no changes in t

Tim Plates.—There are no changes in the New York tin plate market. For 100 lb. coke plates \$3.64 continues to be quoted.

Lead.—Lead is strong at 4.75c., New York, the American Smelting & Refining Company having advanced the price 25 points in the middle of last week. There has not been any great amount of business despite the advance and the market is quiet and has been so throughout the week. Following the advance in lead prices the lead ore market started on the upward trend and as high as \$60.50 base per ton of 80 per cent. lead was paid. The St. Louis price is 4.67½c.

Spelter.—The market for spelter has been very firm in the last week, during which time prices have ranged about 7.25c., New York, and 7.10c., St. Louis. On the Metal Exchange, July 9, 50,000 lb. of spot spelter were sold at 7.10c., St. Louis. The strength of the market continues to be bolstered up by the strength of the

pref. 102 -103 com. 36 - 36 /2 pref. 101 /2 -101 /4

435%

zinc ore prices in the Joplin district. At the same time

Antimony.—Prices for all grades of antimony with the exception of Hallett's, are stronger. Quotations are 8.12½c. for Cookson's, 7.75c. for Hallett's and 7.37½c. to 7.50c. for Chinese and Hungarian grades.

Old Metals.—Quiet conditions prevail, buyers being in a waiting mood. Selling quotations are corrected as

	Cents per lb.
Copper, heavy and crucible	.16.00 to 16.25
Copper, heavy and wire	.15.50 to 15.75
Copper, light and bottoms	.14.00 to 14.25
Brass, heavy	
Brass, light	
Heavy machine composition	
Clean brass turnings	
Composition turnings	
Lead, heavy	4.50
Lead, tea	4.25
7ing corns	5 50

## Chicago

Chicago

JULY 9.—Some variations in the prevailing market quotations for copper have been current during the past week, but the average price has remained about as last quoted. The tin famine appears to have been relieved and domestic prices are lower. Lead and spelter are higher. Trade in old metals is quiet. We quote as follows: Casting copper, 17.50c.; Lake, 17.75c. to 17.87½c., in carloads for prompt shipment; small lots, ¼c. to ¾c. higher; pig tin, carloads, 47c.; small lots, 49c.; lead, desilverized, 4.65c. to 4.70c. for 50-ton lots; corroding, 4.40c. to 4.45c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 7.10c.; Cookson's antimony, 9c., and other grades, 8.50c. in small lots; sheet zinc is \$8.75 f.o.b. La Salle or Peru, Ill., less 8 per cent. discount in carloads of 600-lb. casks. On old metals we quote buying prices for less than carload lots: Copper wire, crucible shapes, 14.75c.; copper bottoms, 12.75c.; copper clips, 14c.; red brass, 12c.; yellow brass 9.25c.; lead pipe, 4c.; zinc, 5c.; pewter, No. 1, 28.50c.; tinfoil, 33c.; block tin pipe, 44c.

#### St. Louis

JULY 8.—The Metal Market has been firm. Lead is sharply higher and firm at 4.65 to 4.67½c. Spelter has also been marked up to 7.05 to 7.10c., with sellers asking more. Tin is quotable at 45.35c. to 45.85c., with lake copper at 17.85c. and electrolytic 17.60c. to 17.75c. Antimony, Cookson's, is quiet at 8.35c. In the Joplin ore market the feature of the week was the sharp advance in lead ore on the 80 per cent. metallic content basis, the quotations ranging \$58 to \$60 per ton, while the choice grades brought \$62 per ton. This was due to the sharp advance in the metal at St. Louis. In zinc blende the high figures continued, the quotation for 60 per cent, metallic content being \$54 to \$58, with the choicest lots bringing \$61. In a few instances basis blende the high figures continued, the quotation for 60 per cent, metallic content being \$54 to \$58, with the choicest lots bringing \$61. In a few instances basis ore brought \$58.50 for immediate delivery. Calamine was stronger at \$29 to \$30 per ton on the 40 per cent. basis, the top price for choice ore being \$35. For miscellaneous scrap we quote as follows: Light brass, 5.50c.; heavy brass and light copper, 9.50c.; heavy copper and copper wire, 10.50c.; pewter, 21c.; tinfoil, 31c.; zinc, 3.50c.; lead, 3.50c.; tea lead, 3c.

# June Copper Production and Stocks

The Copper Producers' Association has issued the following monthly statement for June, 1912:

Stocks of marketable copper of all kinds on hand at all points in the United States June 1	49,615,643
Production of marketable copper in the United States from the domestic and foreign sources in June Deliveries of marketable copper in June:	
For domestic consumption	

The above figures show that the shrinkage in the stock of copper in June was 5,280,639 lb., following a reduction of 15,450,386 lb. in May. This showing is of peculiar interest coming after a week in which speculative influences have had much to do with the copper market abroad and something with that at home.

The report of New York State Geologist Clarke concerning iron ore production in 1911, shows a total of 1,-258,873 tons, or about 300,000 tons less than in 1910. Eleven companies mined iron ore last year.

# Iron and Industrial Stocks

NEW YORK, July 10, 1912.

The value of securities fluctuated rather evenly in the last week until Monday was reached. The weakness and declines shown Monday were caused by an unfavorable showing of bank reserves on Saturday. Nothing otherwise has developed to affect the market to any great extent. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week follows: day of this week follows:

Bald. Loco., com. 56½-59 Bald. Loco., pref. 105½-106½ Beth. Steel, com. 35⅓-38¼ Beth. Steel, pref: 68¾-72½ Can, pref. 116½-118½ Can, pref. 116½-118½ Car & Fdry., com. 57¾-59 Car & Fdry., pref. 117¾ Steel Foundries 35½ Colorado Fuel 29 31½ General Electric 178½-181¼ Gr. N. Ore Cert. 42½-45¼ Int. Harv., pref. 119½ Int. Pump, com. 27½-28½ Int. Pump, pref. 80½-81 Locomotive, com. 42½-44½	Pittsburgh St. Pressed Stee Pressed Stee Railway Spri Republic, or Republic, pre Sloss, com Pipe, com Pipe, pref U. S. Steel, U. S. Steel, Westinghouse Va. I. C. & dam. Ship, p. Chic. Pneu. Cambria Stee Lake Sup. Co.
Locomotive, pref108xd-110	Pa. Steel, pr
	Crucible Stee
Nat. En. & St., com. 16 - 16%	
Nat. En. & St., pref. 90 - 911/4	Crucible Stee

#### Dividenda Declared

The International Steam Pump Company, regular quarterly, 11/2 per cent. on the preferred sock, payable August 1

The Harbison-Walker Refractories Company, quar-ly, 1½ per cent. on the preferred stock, pæyable terly, 1½ per cent. on the preserved stock, paylong J. G. White & Co., Inc., quarterly, 1½ per cent. on the preferred stock, payable August 1.

The Fine Steel Industry.—In "The Evolution of the Fine Steel Industry," a pamphlet of 25 pages, Dr. John A: Mathews, operating manager of the Halcomb Steel Company, Syracuse, N. Y., traces the development of steelmaking processes from the earliest time, but pays particular attention to the oldest melting process, that which employs the crucible. Dr. Mathews locates the beginning of the new era in fine steels between 1860 and 1870 when Mushett produced tungsten-manganese air hardening steel. Citing the article by E. T. Edwards in The Iron Age, in which was the suggestion that the present era in high grade steels is that of "improved" or "superior" high speed steels. Dr. Mathews points out that this dates from 1906, the year in which Rex-AA, the first of the vanadium high speed steel appeared. Reference is made to the fact that the Halcomb Steel Company installed the first electric steel melting furnace in the United States, and the author makes the prediction that within the next ten years electric steel will supplant crucible steel in a large degree, but not altogether. ferring to the progress in the manufacture of tool steels it is stated that even the old-fashioned carbon steels are better than ever, being more uniform, better annealed and more dependable in service.

A recent decision of the United States District Court at Cincinnati, Ohio, overruled the demurrer of the fendants to the indictment found against John H. Patterson and 29 others, who are, or were, officers of the Na-The tional Cash Register Company, of Dayton, Ohio. Government's charge is that the defendants violated the Sherman act, and the court held that if the charges in the indictment are true the company, in its policy toward its competitors, has committed acts of commercial piracy and was guilty of restraint of trade.

The No. 2 furnace of the Woodward Iron Company, Woodward, Ala., which has been relined was blown in last week. The No. I furnace which is to be replaced by the modern stack for which contracts were let some weeks ago, was blown out in the last week in June.

No. 2 furnace of the Susquehanna group of Rogers-Brown Iron Company was put out of blast July 6 for re-

The Detroit Furnace Company, Detroit, Mich., blew in its furnace, formerly known as Wayne, on July 6. It had been out of blast since December 30, 1911.

## Personal

T. M. Wickwire, president Wickwire Steel Company, has been making a visit of inspection at the mining properties of that company in the Iron River district, Michigan.

Thomas V. Salt, manager of the coke oven plant of the Illinois Steel Company at Joliet, has been chosen to build the proposed coke-oven plant for the Inland Steel Company at Indiana Harbor.

Alba B. Johnson, president of the Baldwin Locomotive Works, Philadelphia, Pa., sailed on July 6 for a two months' trip abroad.

William Wigham, assistant to President A. C. Dinkey of the Carnegie Steel Company, Pittsburgh, has returned from Europe.

C. E. Clewell, formerly illuminating engineer with the Westinghouse Electric & Mfg. Company, East Pittsburgh, has accepted the position of assistant professor of electrical engineering at the Sheffield Scientific School, Yale University, New Haven, Conn. He will act as consulting engineer for the Westinghouse Company.

Edwin D. Dreyfus, formerly commercial manager of the Westinghouse Machine Company, East Pittsburgh, is now identified with the West Penn Traction & Power Company, Pittsburgh.

Charles M. Schwab, president of the Bethlehem Steel Company, South Bethlehem, Pa., has accepted an invitation to address the Chamber of Commerce of Youngstown, Ohio, at its annual banquet to be held in November.

W. T. Handwerk has been elected secretary and treasurer of the Slatington Rolling Mills, Slatington, Pa., to succeed W. H. Andrews, who resigned July 1. He will also be the business manager. For some years he had been connected with the old Slatington Rolling Mill Company, and later with the successor, the Slatington Rolling Mills, which have remodeled the plant during the past year.

W. S. Pilling, of Pilling & Crane, Philadelphia, Pa., sails Thursday, July 11, on the Amerika, for a trip of several months abroad.

David P. Hopkins, for eleven years manager of the Addyston, Ohio, plant of the United States Pipe & Foundry Company, has been appointed assistant to President L. R. Lemoine of the company. Mr. Hopkins will make his headquarters in Philadelphia. W. L. Perkins, manager of the Columbus plant of the company, will succeed Mr. Hopkins in the management of the Addyston plant and John Fuller will succeed Mr. Perkins as the manager of the Columbus plant. Mr. Fuller is a son of the purchasing agent of the company.

Frank Salomon, president of the Otto Gas Engine Company, Philadelphia, accompanied by Mrs. Salomon, sailed for Europe, July 4.

L. F. Hamilton, manager of the publicity department of the National Tube Company, Pittsburgh, has returned to his duties after a long illness with typhoid fever.

C. W. Brooke, Machesney Building, Pittsburgh, has been appointed advertising manager of the Homestead Valve Mfg. Company, Homestead, Pa.

H. T. Douglas, Jr., has been chosen chief engineer for the Chicago & Alton Railroad. His offices will be at

B. A. Aikens has been appointed to succeed J. F. Farrell, resigned, as purchasing agent for the Michigan Central Railroad.

Arthur A. Fowler, New York, partner in Rogers, Brown & Co., is in Europe on a three months' trip.

Edward P. Williams, who has been purchasing agent for the Baldwin Locomotive Works, Philadelphia, Pa., for 25 years, has been appointed assistant to the vicepresident of the company. John Lindauer, Jr., who has been associated with Mr. Williams in the purchasing department for a number of years, succeeds him as purchasing agent.

A. Y. Hays has opened a branch office for the United Refrigerator & Ice Machine Company, Kenosha, Wis., at 307 East Fifth avenue, Cincinnati, Ohio.

# Obituary

WILLIAM H. COOPER, secretary of the Bolivar Coal & Coke Company, with offices in the Germania Bank building, Pittsburg, was killed in an automobile accident near Greensburg, Pa., Thursday, July 4. He. was unmarried.

C. Perry Edwards, construction superintendent of the upper and lower Union mills of the Carnegie Steel Company at Youngstown, Ohio, died suddenly at his home in Youngstown on Tuesday, July 2, from heart trouble.

Louis A. Osborn, president of the J. M. & L. A. Osborn Company, Cleveland, Ohio, died July 4, age 47 years. He had been in poor health for about two years and for some time had been able to devote very little attention to his The immediate cause of his death was bronchial pneumonia. He was born in Cleveland and had been engaged in business in that city for 26 years. After leaving high school he entered business in the firm of his uncle and father, at that time known as Meyers, Rause & Co., stove manufacturers. This firm dissolved in 1888 and Mr. Osborn then became engaged in the tinners supply business under the firm name of L. A. Osborn & Co. few years later his father, J. M. Osborn entered the firm and the concern became an incorporated company under the name of the J. M. & L. A. Osborn Company. J. M. Osborn died four years ago. Mr. Osborn had a very wide acquaintance in the trade with which his concern dealt and was held in the highest esteem by his acquaintances. He is survived by his wife, one son and two daughters

WILLIAM A. HARDY, Fitchburg, Mass., head of the William A. Hardy & Sons Company of that city, died July 4, aged 75 years. He was a native of Pepperell, and attended the public schools in Nelson, and Boston, Mass., and later Guilford Academy, Laconia, N. H. He served an apprenticeship in a brass foundry and became expert in metallurgy. In 1861 he took over the business which carried on and developed until his death, manufacturing composition castings, railroad specialties and devices for use in paper machinery. He was a veteran of the Civil War, and served in the Fitchburg city government. He leaves a widow and six sons.

WM, F. BILLENSTEIN, president and general manager of the National Iron & Wire Company, Cleveland, Ohio, re-ceived injuries, from which he died shortly afterward, by being struck by a train while driving an automobile across the Lake Shore Railroad tracks in Cleveland, 8. He was 49 years of age. Mrs. Billenstein and three children, who were with him, were seriously injured.

## Manganese Ore Production in 1911

The production of manganese ores in 1911, according to E. F. Burchard, of the United States Geological Survey, was 2457 gross tons, valued at \$24,586, a slight increase over the figures for 1910. The ore was mined in California and Virginia.

The importation of manganese ores continues to greatly exceed the domestic production, and will probably continue to do so as long as the principal sources of foreign supply are abundant and cheaply worked, and ocean freights are low. In 1911 the imports were 176,852 gross tons, valued at \$1,186,791, a decrease of 65,496 tons as compared with the importations for 1910. This decrease in the demand for manganese is attributed to the depres-

sion in the iron and steel industry.

The statistics of production and imports of manganese ores, and a discussion of the foreign and domestic sources of manganese, are contained in an advance chapter by Mr. Burchard from Mineral Resources for 1911, now being printed. The report also contains notes on some newly reported deposits in the United States. A copy of the report may be obtained free on application to the Director of the Geological Survey, Washington, D. C.

The Allen Manufacturing Company, Inc., Hartford, Conn., has recently started a factory at 29 St. David's Lane, Montreal, Canada, for the manufacture of Allen safety set screws. The treasurer of the company, S. K. Dimock, is in charge of the new plant. The outlook is reported promising for the building of a considerable branch of the business in Montreal.

# Pittsburgh and Vicinity Business Notes

The Pittsburgh office of the Buckeye Engine Company, Salem, Ohio, James T. Castle, manager, is installing a 700 hp. cross compound engine, direct connected to a Crocker-Wheeler generator, in the power plant of J. L. Steifel & Sons, Wheeling, W. Va. Among other contracts closed in June for Buckeye engines were: Washington Coal & Coke Company, Star Junction, Pa., 750-hp. cross compound engine, direct-connected to generator, making the third Buckeye unit installed in this plant; W. Harry Brown Company, 475-hp. simple engine, direct-connected to generator, for installation in the Alicia coal works, South Brownsville, Pa.; Capitol City Supply Company, Charleston, W. Va., 500-hp. simple engine, direct-connected to generator; Madison Railway & Light Company, Madison, Ind., 500-hp. cross-compound engine; Ridgway Electric Light Company, Ridgway, Pa., 300-hp. tandem double-acting gas engine, direct-connected to generator.

The Pittsburgh Piping & Equipment Company is making a number of improvements and additions to its plant in Pittsburgh. Two new steel frame buildings, each 55 x 100 ft., are being added to the pipe and machine shops. There will also be placed two 10-ton electric traveling cranes to be operated on 50-ft. spans. The order for these cranes was placed with Samuel W. Hays Sons, Keenan Building, Pittsburgh.

The Connellsville Mfg. & Mine Supply Company, Connellsville, Pa., will soon put on the market a new type of coke pusher, leveler and conveyor, for which strong claims are made. With the new machines, the pusher, instead of being a telescope-ram, will be a continuous one. The conveyor will take the coke out of the ovens to the cars, and the leveler levels the coal in the ovens when they are refilled.

The Crucible Steel Company of America has bought a farm of 132 acres adjacent to its works, now under erection at Midland, Pa., which will be used as a site for homes for its workmen. It will build 300 to 400 houses. Construction has already started.

To finance improvements under way and contemplated, the Keystone Tube Works, Inc., Connellsville, Pa., has sold \$50,000 in bonds of an issue of \$100,000 recently authorized. The company has a new warehouse, and also a steel building in which equipment will be installed for making square tubing. Orders have been placed for electric motors to displace steam for all purposes except driving the rolls. A monorail crane has been installed, and an order placed for 10-ton traveling crane fitted with electric magnet.

The Bessemer Gas Engine Company, Grove City, Pa., has recently taken orders for about 20 gas engines, ranging in size from 40 to 80 hp., for delivery in the Cincinnati district. The company has recently opened branch offices at Wichita, Medicine Hap and San Francisco.

With the exception of the plant of a manufacturer of black and galvanized iron and steel sheets, all the larger manufacturing plants in the Youngstown district started up practically full on Monday, July 8, after the holiday shutdown last week: All the mills of the Republic Iron & Steel Company, including the Brown-Bonnell works, Mahoning Valley works and the Bessemer and openhearth steel plants, are in full operation. All the plants of the Youngstown Sheet & Tube Company started up to practically full capacity. At the Ohio works of the Carnegie Steel Company all departments are on full with the exception of No. 5 blast furnace, which is out for relining.

The Mesta Machine Company, Pittsburgh, has received an order for practically the entire equipment for the tin plate mill of the Trumbull Steel Company at Warren, Ohio. The contract includes eight 28-in. hot tin mills; nine 24-in. cold mills, hot tin mill gear drive and cold mill gear drive, and a 34 and 60 x 60-in. tandem-compound Corliss engine; eight 36-in, motor-driven double shearing machines: seven 40-in. belt-driven squaring shearing machines; one 54-in. belt-driven squaring shearing machine; one 50-in. motor-driven roll lathe; one 57-in. Helander barometric condenser; two three-arm high-type Mesta tin plate pickling machines and a shear table. The Trumbull Steel Company expects to have its tin plate plant completed about January.

The George T. Ladd Company, Farmers' Bank Build-

ing, Pittsburgh, has sold to the American Sheet & Tin Plate Company, Pittsburgh, three 150-hp. horizontal tubular boilers built by the Ames Iron Works, Oswego, N. Y., and has taken orders for a number of non-return valves and steam traps manufactured by the Wright Company, Detroit, and for a number of steam and oil separators made by the Austin Mfg. Company, Detroit.

The National Engine & Mfg. Company, Youngstown, Ohio, recently incorporated with a capital stock of \$25,000, will shortly establish a plant at Girard, to manufacture rotary oil engines, rotary steam engines, steel railroad ties and rail joint splices. The company has taken over the plant of the Girard Foundry & Machine Company, which will be equipped with the necessary machinery. It is in the market for about 20 standard machine tools, including boring and milling machines, planing machines, shaping machines and drilling machines. The officers are: H. R. Greenlee, president, formerly secretary and treasurer of the American Belting Company, Youngstown; W. J. Sheldon, vice-president and general manager; Charles F. McLaughlin, Pittsburgh, secretary and treasurer. The company is shortly to increase its capital stock to \$200,000.

The United States Steel Railway Tie Company, Pittsburgh, owner of the Maxey cast steel tie, has leased rights to the Kiski Steel Casting Company, Avonmore, Pa., for a term of 17 years. The lessee will control all territory in the United States east of the Mississippi River. The Kiski Steel Casting Company is adding some new equipment and improving its plant, after being closed down for several months, and expects to begin operations on a large scale this month.

On the occasion of the meeting of the American Iron & Steel Institute to be held in Pittsburgh in October, a special train will carry the delegates to Youngstown, Ohio, where an inspection of some of the notable plants in that city will be made. A committee of arrangements has been appointed at Youngstown to take care of the delegates and consists of J. G. Butler, Jr., of the Brier Hill Steel Company, and J. A. Campbell, president of the Youngstown Sheet & Tube Company.

The name of the McInnes-McCleary Foundry Company of Wellsburg, W. Va., has been changed to the McInnes Foundry Company.

The following are the bids received by the water committee of the borough of Phoenixville, Pa., for a 3,000,000-gal. filter plant and a low-service pumping engine complete, Chester & Fleming, consulting engineers, Pittsburgh: Pittsburgh Filter Mfg. Company, Pittsburgh, Pa., \$40,725; New York Construction Jewell Filter Company, New York City, \$46,728; American Water Softener Company, Philadelphia, Pa., \$47,400; Roberts Filter Mfg. Company, Darby, Philadelphia, Pa., \$38,533; Pittsburgh Construction Company, Pittsburgh, Pa., \$35,500.

Charters are being applied for by the Cambria Light, Heat & Power Company, the Carr Light, Heat & Power Company, the Chest Creek Light, Heat & Power Company, the Moss Creek Light, Heat & Power Company, the Red Top Light, Heat & Power Company and the Sterling Light, Heat & Power Company by interests identified with the Penn Central Light & Power Company, Johnstown, Pa. It is stated that the six companies are to be operated throughout Cambria County and central Pennsylvania and propose erecting extensive power houses and constructing distributing lines throughout the coal mining section where they will supply power for operating mining plants, town lighting plants and industrial plants.

The Pennsylvania Lines west of Pittsburgh, through H. O. Hukill, purchasing agent, has placed orders for five Pacific-type passenger locomotives and 32 consolidation-type freight locomotives with the Juniata shops of the Pennsylvania Railroad Company at Altoona, Pa., and 13 switching locomotives, Class B-29, with the Lima Locomotive & Machine Company, Lima, Ohio. The material will be purchased in accordance with specifications of the Pennsylvania Railroad Company.

The Trumbull Steel Company, which will build a tinplate plant at Warren, Ohio, has placed a contract for the steel buildings with the Riter-Conley Mfg. Company, of Pittsburgh. The main building will be 80 x 105 ft., while the tin house will be 70 x 500 ft. Some 1400 tons of steel will be used in the construction of these buildings.

The Columbia Steel & Shafting Company, Pittsburgh, manufacturer of Columbia turned and polished shafting, cold drawn screw stock and special shapes, has opened an office in Room 802 Marshall Building, Boston, Mass.. in Charge of J. E. G. Coxwell, formerly connected with the Compressed Steel Shafting Company, Boston.

The Struthers Furnace Company is adding a fifth hot

blast stove to its blast furnace at Struthers, Ohio, and the contract has been placed with the Wm. B. Pollock Com-

pany, of Youngstown, Ohio.

In June the Bessemer & Lake Erie Railroad, operated Carnegie Steel Company, of Pittsburgh, hauled 1,-153,000 tons of ore to the blast furnaces of this concern in the Pittsburgh district. This is the largest amount of

The Dravo-Doyle Company, Pittsburgh, has received a contract from the city of Wheeling, W. Va., for a 20-kw. steam turbine and generator to be used at the Wheeling

The Melvin-Lloyd Company has been incorporated with a capital stock of \$10,000 to engage in the foundry business

in Youngstown. Ohio.

The Maiwurm Aluminum Works, Erie, Pa., which has increased its capital stock from \$10,000 to \$25,000, manufactures aluminum kitchen utensils by a process for which the company will use special machinery of its own design and make. The output averages from 3000 to 4000 lb. of per day. The foundry equipment melts about 2000 lb. of complimetal daily. The company makes a specialty of complicated aluminum castings for which it uses an alloy vented by Paul Maiwurm, president and manager. Julius E. Curtze is secretary and treasurer of the company.

The Hill & Griffith Company, Cincinnati, Ohio, James A. Carey, manager, has established a warehouse in Pitts-

burgh, to carry foundry casings, supplies and equipment.

# Anthracite Production in 1911

The production of anthracite in Pennsylvania in 1911, according to a statement just issued by Edward W. Parker, of the United States Geological Survey, broke all previous records, exceeding the previous maximum output in 1907 by 4,700,000 gross tons. The complete returns to the Survey show a production in 1911 of 80,732,015 gross tons, valued at \$174,852,843. This was an increase over the 1910 output of 5,298,767 tons in quantity and \$14.577,541 in value

In this increased activity and augmented production in 1911 the anthracite industry was in marked contrast to the bituminous industry, which showed decreases throughout most of the mining regions. Moreover, in most of the bituminous districts prices were generally lower, whereas the average price of anthracite in 1911 was 5 cents a ton higher than in 1910. Prices for the domestic sizes remained the same, but greater returns were received from

pea coal and the smaller sizes.

The greater production of anthracite in 1911 was probably due to increased activity in anticipation of a possible coal strike in April. However, the extremely severe weather of the winter practically exhausted any accumulated coal before the termination of the 3-year period of

wage agreements on March 31, 1912.

It is an interesting fact, showing the highly organized condition of the anthracite industry-the so-called coal trust—that whereas in former years there was enormous mine waste in this industry, nowadays practically every-thing mined is utilized. Formerly enormous quantities of small coal and coal dust were thrown on the waste heap, but now such "waste" is sold as it is mined, and the culm piles are being reworked. In 1911 the recovery from the culm piles and the smaller sizes obtained from the freshly mined coal constituted over 40 per cent. of the total quantity of anthracite marketed.

While the No. 2 furnace of the Toledo Furnace Company, Toledo, Ohio, which was blown out June 30, is being relined, a number of other improvements will be made, including a new top.

The Philadelphia Steel & Wire Company has moved its general offices to its Camden plant, Pearl street and Delaware avenue, Camden, N. J.

## Customs Decisions

## Watchman's Clock Movements and Cases

The Board of United States General Appraisers has overruled protests filed by the Chicago Watchman's Clock Works. Duty was assessed on the movements and the cases of watchman's time detectors separately. It was claimed that duty should only have been levied on the movements at the specific rate and that no duty should have been collected on the cases.

Importance of Precise Description of Invoice

The decision of the collector at Chicago was also affirmed in regard to the protest of the Universal Shipping Company. Aluminum was assessed at II cents per pound under paragraph 172 of the present tariff act as "alumi-mum in sheets." The goods were invoiced as "aluminum sheet" and the report of the local appraiser referred to it as "aluminum in the form of sheets and circles or disks." The witness for the impact of the circles or disks." The witness for the importers had not seen the goods, but testified from the invoice description that the invoice specifications covered aluminum in sheet form as well as aluminum in long strips. As the proof as to the exact form of aluminum that was really imported was so unsatisfactory the board found they were unable to base a proper finding of fact thereon, and accordingly the protestant's claim of 45 per cent, ad valorem as "manufac-tures of aluminum not specially provided for" was over-

#### Laquered Tin Boxes as Containers

Regarding an importation of lacquered tin boxes used as containers of paints, B. Illfelder & Co. protested against the assessment of duty at 4 cents per pound and 35 per cent. ad valorem under the provisions of paragraph 195 of the tariff act of 1909, claiming that the metal boxes were properly dutiable at the rate applicable to the paints. Following a previous ruling of the United States Court of Customs Appeals, in which the same importers were the litigants, the board affirmed the collector's levy of duties. On the authority of the same decision the protests of the American Shipping Company and Wakem & McLaughlin were overruled, the lacquered metal cases in this instance however, holding smoking tobacco. The goods were as-sessed at 55 per cent. and were claimed free of duty as the usual and ordinary coverings for the contained mer-

# Carteret Steel Company Receiver's Sale

The New Jersey properties of the Carteret Steel Company, which for several years have been in the hands of John S. Gibson as receiver, were sold in the past week for about \$30,000, being bid in by the Jones interests which were original owners and also principal creditors, Senator Jones of Nevada having secured control of the company more than 10 years ago. The property includes the old Hackettstown, N. J. furnace, abandoned for several years, also the Green Pond iron mine near Rockaway, N. J., which has not been worked for 10 years. The ore runs as high as 60 per cent. in iron, but contains 2 to 3 per cent. sulphur and requires to be calcined.

The Hess-Bright Mfg. Company has transferred its office to its new factory at Front street and Erie avenue, Philadelphia, Pa. Removal of the manufacturing department of the business will be performed progressively in The old quarters at Twenty-first street and Fairmount avenue have for the past two years been inadequate for the rapidly growing business of the company, and the new site, which covers some 13 acres, affords room for expansion. The factory buildings are one story high and embody advanced ideas on modern factory arrangement.

Bagley, Mills & Co., Ltd., 92 Victoria street, London, and 50 Church street, New York, representing Carl Still, Recklinghausen, Germany, note the receipt of a repeat order from the Concordia Mining Company, Oberhausen, Germany, for a battery of 55 Still regenerative high Germany, for a battery of 55 Still regenerative high capacity coke ovens, equipped with the new Still direct ammonia recovery plant. These ovens take a charge of 12½ to 13½ tons and the coking period shows a considerable reduction from recent usual practice. Carl Still is also erecting a direct recovery plant for the König Ludwig Colliery Company for 480 ovens.

# New Tools and Appliances

This is essentially a news department for which information is invited.

Horizontal Cylinder Boring Machine.-For simultaneously boring and facing the cylinders of steam, gas and gasoline engines, pumps and locomotives, the Barrett Machine Tool Company, Meadville, Pa., has recently brought out a horizontal boring machine. It is mounted a heavy bed having a widened portion provided with cross and longitudinal T slots for holding the work in position. The pedestals at either end of the base are 24 in. from the top of the bed to the center of the boring bar and one of these is adjustable on the bed from o to 60 in. The 6-in. boring bar has continuous feed travel in either direction and will bore out a 60-in. cylinder in The end is fitted with a No. 6 Morse taper one setting. hole with draw and drift slots so that smaller bars can be used if necessary. When this is done, a sleeve is placed in the tail pedestal bearing for supporting the outer end of the boring bar. A quick change feed box renders ten feeds varying from 1/32 to 7/16 in. per revolution of the boring bar available, and the changes can be made almost instantaneously. There are two heavy facing arms mounted on the ends of the sleeves which are driven by friction. They hang on the end of the sleeve when not in use and do not interfere with the rotation of the boring bar or its longitudinal travel. A sliding block traveling at right angles with the boring bar that is fed by a star feed carries a secondary block on which is mounted a tool for facing or turning off the outside diameters of the cylinder flanges. This tool can be fed down to within I in. of the boring bar and is readily removable.

Sand Rammer.—A new type of pneumatic sand rammer which is adapted for general foundry work or for bench or core ramming has been placed on the market by the Cleveland Pneumatic Tool Company, Cleveland, Ohio. This device is built in a number of different styles and sizes, and all the sizes have either a round or grooved rod, as may be preferred, and a butt and pein. The groove is cut in the rod to prevent it from turning except as desired by the operator. The piston rods are packed with a special design of packing which prevents dirt from getting into the piston chamber and clogging the working parts. Among the advantages claimed for the rammers are light weight and operation at high speeds and with practically no vibration. The floor rammer has an exhaust deflector which prevents the air from blowing on the operator or those who might be working with him.

Interchangeable Tool Holder.—A new interchangeable tool holder which is called the Kwik Action has been recently added to the line of the Meriden Press & Drop Company, Meriden, Conn. At present the holder is in the form of a screw driver for tight corners and narrow spaces. Steel blades for either machine or wood screws can be inserted easily by a twist of the fingers and screws set in electrical instruments, typewriters, automobiles and other machines where the space may be as small as 1½ in. It is planned to make other inserts so that the holder can be fitted with socket wrenches or special tools for large factory work, etc.

Tool Rack.—For machine shops and tool manufacturing plants, the Wisconsin Foundry & Machine Company, Madison, Wis., is making a tool rack having cast iron trays and round steel legs; the latter being threaded into the top tray and passing through the lower ones. Any number of trays can be furnished and they serve as stiffeners for the legs which are of 1-in. round steel. The standard racks are made with 20 x 25-in. trays and have a total hight of 6 in. Swiveling casters with 4-in. wheels are fastened to the legs, but if a stationary rack is wanted 34-in. pipe legs with floor flanges are furnished. One of the uses for these racks, which can be furnished with drawers if desired, is as a substitute for the tote truck for conveying products from one tool to another or between departments. The crated shipping weight of one of these racks is approximately 200 lb.

Inserted Chaser Taps.—Winter Brothers Company, Wrentham, Mass., has developed a line of inserted chaser taps in which the body is made of machinery steel or cast

iron and the chasers are held in slots having parallel sides. The chasers are made of flat stock with parallel sides and the bottom is milled off, thus leaving a shoulder about ½ in. high near the front end. In assembling the tap the shoulder is set against one end, which locates each chaser accurately and the binding pins which have one side flattened are driven in place so that the flat side bears against the angular surface of the chaser and holds it firmly against the ends and bottoms of the slots. Drill rod or screw stock is used for the pins and it is not necessary to drive them very hard or insert them to any great distance. The chasers are driven out endwise to remove them which also brings the pins with them.

Motor-Driven Lathe .- A new line of motor-driven lathes, having swings from 13 to 30 in; has by the Whitcomb-Blaisdell Machine Tool brought out Company, Worcester, Mass. All the gearing is placed at the forward end of the headstock, while the opposite end is arranged for the reception of the motor, which is placed very low to avoid the appearance of topheaviness. Double back gears which in common with the other headstock gears are inclosed by the cover are provided. The back gears are shifted by a lever in the front of the headstock, which is keyed to a shaft that carries a pinion on its other end but engages the rack controlling the sliding back A positive lock is provided to prevent the back gears. gears jumping out of engagement while heavy cuts are being taken and an automatic locking mechanism prevents them from sliding except when thrown back or from being thrown into engagement when not in the proper position. The spindle has three bearings, one being located in the tie piece across the middle of the headstock. Shunt-wound commutating pole motors and reversing-drum controllers with a speed range of 3 to 1 and automatic overload and no-voltage release panels are recommended for driving

Post for Pipe Vise.—For facilitating the setting up of pipe vises the Mason Machine Company, Bridgeport, Pa., has brought out a post which is made of 1½-in. wrought-iron pipe slipped into a 2-in. pipe. The clamping device which permits the adjustment to hights ranging from 6 to 11 ft. is fitted at the top of the larger pipe and a screw jacking device that is turned after the post is in place is located at the base. The turning of the jack screw is performed without twisting the post out of position by the use of a swivel at the top. To prevent slippage little spuds are placed in the base and the head. The vise is screwed fast to an oak block which is fastened to the larger pipe. Pipes up to 3 in. in diameter can be handled by the vise on the post, which weighs 50 lb.

Two-Head Radial Drilling and Tapping Machine.—Taylor & Fenn Company, Hartford, Conn., has recently made an improvement in its radial drilling machine, which was illustrated in *The Iron Age*, November 24, 1910, that enables one head of the machine to be employed for drilling operations only, while the other can be used for tapping through the addition of a reversing mechanism for the spindle. Any of the builder's standard heads can be applied to the arm and the spindles can, if necessary, be driven at different speeds.

Knurling Tool.—Edgar T. Ward & Sons Company. Boston, Mass., has developed a new type of knurling tool which has a capacity for work up to 34 in. in diameter. Three knurls support the work and an extra set is stored in the handle, which is hollow.

Water Tool-Grinding Machine .-Three sizes of tool grinding machines, carrying wheels 16, 20 and 24 in. in diameter respectively, have been developed by the Northampton Emery Wheel Company, Leeds, Mass. The water is contained in a tank formed in the base of the machine and an endless chain, the lower portion of which is mersed in the water, carries it to the abrasive wheel. chain passes over a shaft in the base and an extension of the main spindle and the water is thrown against the wheel by the centrifugal force of the chain as it runs. these shafts have flanged pulleys mounted upon them and power is transmitted from the main spindle to the lower shaft through a belt connection. A lever at the side of the machine controls an idler for tightening the belt and also the amount of water delivered to the wheel.

# The Machinery Markets

Activity in the machinery trade taken as a whole is beginning to feel the effects of the summer season, but the trade is doing better than is usual at the beginning of the hot months and the vacation season. In New York two or three small lists of machine tool requirements are before the trade, but contributing most business are miscellaneous demands from scattered sources. New England builders of machinery are still feeling the impetus of recent months and a better demand is coming from the railroads, although trade tends to slacken. In Philadelphia anticipated inquiries are yet to appear and trade is quiet. Conditions are fair in Cleveland, due to a good volume of miscellaneous sales both of new and second-hand machinery, some of the former to the railroads. Cincinnati expects orders to be placed very soon against a good sized list of the Canadian Pacific Railway, the export trade is good for the season and there is an especially good call for the smaller units of electrical equipment. In Detroit, where auto plants will soon shut down for two weeks for repairs and vacations, the market is fairly active and there is a good demand for medium sized power equipment. Interest in St. Louis centers in the big list of the Busch-Sulzer Bros.-Diesel Engine Company which contains over 100 tools. The Central South is dull, but confidence is felt for the second half of the year. In Birmingham the second half has started well and the outlook is good also. The principal demand in Texas is for pumping machinery. The Pacific coast is dull and the only feature there is a good demand for secondhand machinery.

# New York

NEW YORK, July 10, 1912.

Although a falling off in trade is to be expected in Although a falling off in trade is to be expected in the hot months nearly all New York machinery houses say they are getting a satisfactory amount of business and that the activity is much better than had been expected. There are two or three fair lists before the trade and there is a good run of miscellaneous requirements which some dealers say they prefer rather than a big list, which ordinarily means a scramble and high expenses to land orders, with the added disadvantages expenses to land orders, with the added disadvantages of excessive price cutting. It is understood that the General Electric Company of Schenectady, N. Y., is to adopt a policy of issuing monthly lists of its machinery needs, as a result of a plan to decentralize the works of the company. New York salesmen have been frequent visitors of late to Philadelphia, where in several instances orders were forthcoming and more are looked for, particularly in the line of turret lathes and automatics.

The De La Vergne Machine Company, New York, is in the market for the following machines tools:

One 21-in. Gisholt turret lathe.
One 36-in. vertical turret machine.
One 30-in. x 10-ft. engine lathe.
One 24-in. x 10-ft. engine lathe.
Two 18-in. x 8-ft. engine lathes.
One 18-in. x 6-ft. engine lathe.
One radial drilling machine, 5-ft. arm.
One No. 4 milling machine.
Two double head shaping machines.
One disk grinding machine.

The International Type Setting Company of Brook Ine International Type Setting Company of Brooklyn, N. Y., which was announced last week as in the market, has not yet formally closed against a small list. This company promises to be a purchaser, at least in small lots, for some time to come. Manufacturers of screw machine products say they find it difficult to keep up with the demand, which is regarded as a good indication of activity in general manufacturing.

Cawley, Clark & Co., Newark, N. J., have had plans prepared and have awarded a contract to the David Henry Building Company for the erection of two additional buildings to its plant on Passaic street. The building is estimated to cost \$50,000.

The Gould Coupler Company, with works at Depew, N. Y., has let the contract for an addition to its steel casting plant, 150 x 600 ft. It will be equipped with traveling cranes throughout.

The N. A. Steevens Garage, Owego, N. Y., has had plans prepared for the erection of an addition to its machine shop. Some additional metal working machines will be required.

The Easton-Talbot Company, Albany, N. Y., has awarded a contract to the Marcello Construction Company, Portsmouth, N. H., for the rebuilding of its paper mill recently destroyed by fire. The cost will be \$37,000.

The Board of Trustees of the New York State Hospital for Incipient Tuberculosis, Ray Brook, N. Y., is receiving proposals for installing one 50 km. direct connected engine and dynamo.

The Board of Water Commissioners of the Village of White Plains, N. Y., will receive bids until July 22 for furnishing and erecting a compressor at the Orchard street pumping station, in accordance with specifica-

Bids will be received until July 30 by the State Board of Public Works, Albany, N. Y., for power plants, substation and equipment necessary to complete installation at Locks 1, 2, 7 and 8 on the Oswego Canal.

The Tri-County Light & Power Company, Gilboa, N. Y., has received authority from the Public Service Commission to issue capital stock to the amount of

\$5,000 to \$60,900 to be used for the construction of dam and power house with requisite equipment of electrical apparatus; also for a distributing system in Gilboa and transmission lines.

E. D. & A. F. Cronk, Utica, N. Y., will build a two-story addition to their machine shop on Hotel street.

The shops of the Ontario & Western Railroad at

Middletown, N. Y., were damaged by fire July 3. The glazing and tank shops being destroyed.

The Village Board of Mamaroneck, N. Y., is having plans for a sewage disposal plant prepared by Hering & Gregory, 170 Broadway, New York. J. M. Duffy, is Village Engineer. Gregory, 170 Bro Village Engineer.

The Fulton County Gas & Electric Company, Johnstown, N. Y., has been granted authority by the Public Service Commission to issue \$30,000 in notes, the proceeds to be used for additions and improvements to be made to the company's plant.

The taxpayers of Avon, N. Y., have voted to construct a sewage disposal plant in connection with a sewerage system to be built this summer.

The National Desk Company, Herkimer, N. Y., is building an addition to its plant, 40 x 68 ft., two stories.

The Public Service Commission has authorized the Wayne Power Company, Cohocton, N. Y., to issue \$105,000 in bonds and \$10,000 in capital stock and to expend the proceeds for the erection and equipment of substations in Cohocton, Avoca, Atlanta and Wallace, and to construct necessary distributing systems and transmission lines. transmission lines.

The cooperage plant of Grief Brothers, Niagara Falls, N. Y. was totally destroyed by fire on July 6, entailing a loss of \$40,000, the larger proportion of which was on machinery. The plant will be rebuilt and re-equipped at once.

The Little Non-Refillable Bottle Company, Buffalo, N. Y. has been incorporated with a capital stock of \$50,000, and will equip a plant for the manufacture of patented non-refillable glass bottles. R. A. Little, O. E.

patented non-refillable glass bottles. R. A. Little, O. E. Westcott and J. J. Lyon, of Buffalo, are the directors.

The August Feine & Sons Company, Buffalo, has been incorporated with a capital stock of \$50,000 by August, August L., George R. and Charles F. Feine and others to take over and continue the business of August Feine, manufacturers of wrought and ornamental ironwork. The company has purchased a new manufacturing site at Abbey and Mystic streets and the Lackawanna Railroad and a little later will erect and equip a plant for the fabrication of metals, including structural steel.

# New England

Boston, Mass., July 9, 1912.

The dealers are noticing the effect of the summer season in their business, but the builders of metal working machinery, as a whole, continue to feel the improvement which has characterized the past few months. The tool steel people report an increasing demand from the railroads. Apparently the political situation has cleared, in its effect upon the confidence of business

The jewelry manufacturers of Providence, R. I., and vicinity are not especially busy as a whole, and therefore the demand for the light machinery which they use is dull. The machine tool people which serve this section of New England find that business is fairly good outside of the jewelry trade, and the manufacturers of ma-

of the jewelry trade, and the manufacturers of machinery are experiencing an active demand.

The Wyman & Gordon Company, Worcester, Mass., manufacturer of drop forgings, is adding a department which will take crank shaft forgings and completely finish them, ready for use in an automobile. The equipment consists of Reed-Prentice and Whitcomb-Blaisdell lathes, Norton grinding machines and Becker milling machines. The company is preparing plans for a three-story factory building 50 x 150 ft.

The new building of the Athol Machine Company, Athol, Mass., will be 60 x 140 ft., of brick and concrete, and will be occupied as a machine shop. Its equipment will be modern throughout. The company's manufacturing capacity will be largely increased, opportunity being given for the employment of 150 additional men.

The W. & B. Douglas Company, Middletown, Conn., manufacturer of pumps, suffered a loss of \$4,000 by fire June 30. Sheds used for the storage of wooden and metal molds, with much of their contents, were lost. Various cities and towns on the line of the Grand Trunk Railroad, to be constructed in Massachusetts and Rhode Island, are agitating the question of the location of the company's reasir show.

Trunk Railroad, to be constructed in Massachusetts and Rhode Island, are agitating the question of the location of the company's repair shops. They will be on a considerable scale, of necessity, for the only existing shops of the system which could possibly be used are those of the Vermont Central, and these would be too remote for economical handling of work. It is unlikely, however, that any decision concerning the site will be made this year, as the completion of the line will be probably two years or more in the future.

this year, as the completion of the line will be probably two years or more in the future.

The new building of the Locomobile Company of America, Bridgeport, Conn., will be used as a truck erecting shop, and little equipment will be needed with the exception of a small drilling machine, a sensitive drilling machine, abrasive wheels and a few other supplies

Edward Miller & Co., Meriden, Conn., manufacturers of gas and electric fixtures and kerosene lamps and fixtures, will erect a building 35 x 60 ft., five stories, to replace an old wooden structure. No equipment will be

required, the company states.

The Premier Mfg. Company, Inc., Newtown, Conn., has been incorporated to manufacture air pumps, and will establish a factory at Newtown. The incorporators are Alfred C. Griscom, Julius Hartwig and Louise Hart-

The new building which will be erected by the Standard Company, Torrington, Conn., will be devoted to the manufacture of lines which up to the present time have been produced at the plant of one of the allied companies at Newark, N. J., and to provide for expansion of the company's present lines. The building will be 100 x 336 ft., one story. The company manufactures spokes, nipples, pedals, toe clips and spark plugs.

Announcement is made at Hartford, Conn., that the Walsh-Standard Store Service Company has been incorporated with a capital stock of \$125,000 to take over the business of the Standard Mfg. Company, Springfield, Mass., and the Walsh Store Service Company, Syracuse. N. Y., and to establish a factory at Hartford. L. W. Chism, Springfield, will be the general manager.

The Waterbury Buckle Company, Waterbury, Conn., will erect a factory building, 58 x 123 ft., three stories and basement.

and basement.

The Hartford Rubber Works, Hartford, Conn., will build a power house 50 x 100 ft. and 60 ft. high, of reinforced concrete, with concrete floors and roof. Boilers of 300 hp. turbines ar np. capacity will be installed, and later setam and electric generators.

Additions to general manufacture works in New England include the following: Consolidated Rendering Company, New Hayen, Conn., building to cost \$50,000; Forsythe Dyeing Company, New Hayen, Conn., two-story factory, 70 x 249 ft.; American Grauhophone Company, Bridgeport, Conn., building, 50 x 54 ft.; Green & Daniels, Pawtucket, R. I., textiles, building 67 x 99 ft. three stories, and 34 x 100 ft. one story.

# Philadelphia

PHILADELPHIA, PA., July 9, 1912.

Mid year stock taking, suspensions of operations for Mid year stock taking, suspensions of operations for minor repairs and the intervening holiday have had considerable bearing on the volume of business transacted in the past week. Sales have been light, confined for the most part to cleaning up propositions already under negotiation. Very little new inquiry usual at this season has come out. Some plants suspended operations for the week end following July 4. General conditions in the trade show practically no change, business having a tendency to drag. The trade looks forward to more active conditions in the second half of the year. In some lines a dull summer is anticipated with heavier buying following in the fall. Industrial establishments, particularly in the metal lines, are becoming more buying following in the fall. Industrial establishments, particularly in the metal lines, are becoming more actively engaged and the promise of continued activity for months ahead will eventually be felt by the machine tool trade. Machine tool builders while more actively tool trade. Machine tool builders while more actively engaged than they were several months ago, are generally operating under capacity. A fair business is reported in power transmission specialties for export. The boiler and engine trade has considerable business

under negotiation.

Second-hand machinery has been quiet. Both steel and gray iron foundries have been better engaged, although production has been curtailed during the week. The Helper Engineering Company, 1520 Real Estate Trust Building, is in the market for a second-hand electric magnet of one or two tons capacity, to be used for handling pig iron with a locomotive crane.

The Germantown Tool Works has given the contract for its new plant at Second and Ashdale streets to F. W. Van Loon. While a large share of the machinery equipment in its present plant will be transferred to the new one, additional equipment will be required and the company expects to consider the matter of its purchases

new one, additional equipment will be required and the company expects to consider the matter of its purchases in the near future.

William Sellers & Co., machine tool builders, who recently purchased a tract of land at Holmes Station, on the Baltimore & Ohio Railroad, is preparing plans for two modern foundry buildings, about 400 ft. long. The new plant will embody the latest modern construction and equipment for foundry work.

The Penn Steel Castings & Machine Company, Chester, Pa., advises that the current report that it would make considerable improvements and extensions to its plant is an error, no work of this kind being contem-

plant is an error, no work of this kind being contem-plated at the present time.

The Reading Iron Company, Reading, Pa., will erect a brick and steel machine shop at its plant at Ninth and Kutztown streets, to replace the present structure, which is of frame. The building will be 51 x 112 ft., and is in line with the company's policy of replacing the frame buildings of its plant by modern shop buildings.

Plans are being prepared by Sauer & Hahn for the erection of a four-story garage, 80 x 86 ft., for the Pullman Taxicab Company, on Wood below Sixteenth street. The new building is to be entirely of fireproof

street. The new building is to be entirely of fireproof construction. Details, however, are not yet available. Plans are in progress for a ten-story brick and concrete warehouse, 170x300 ft., to be erected at Tenth and Berks streets, for N. Snellenburg & Co. William Steele & Sons are the architects and engineers. A. F. Hammond, Superintendent of Supplies, Room 392, City Hall, Philadelphia, Pa., will take bids until July 18 for laboratory apparatus and fittings, equipment and tools for manual training shops, and a Blue Streak continuous electric blue print machine.

# Chicago

CHICAGO, ILL., July 9, 1912.

The Stay-Lock Company, Chicago, has been organized with a capital stock of \$10,000 to do a general manufacturing and merchandising business. The incorporators are R. L. Funk, James Montgomery and A. W. Williams.

Williams.

The Chicago-Racine Aluminum Brass & Iron Works, Chicago, has filed notice of an increase in its capital stock from \$16,000 to \$30,000.

The Continuous Rail Company of Illinois, Chicago, has been incorporated with a capital stock of \$5,000 to engage in the general rail equipment and construction business. The incorporators are W. R. Watson, L. Earle Powell and Albert T, Phelps.

The By-Products Coke Company, Chicago, a subsidiary of the Semet Solvay Company, will build a new machine shop 92 x 164 ft. at 11200 Torrance avenue, to cost \$20,000.

The Morden Frog & Crossing Works, Chicago

Heights, Ill., has let contracts for a new pattern shop

Heights, Ill., has let contracts for a new pattern shop and storage 40 x 65 ft., to cost \$4,000.

The Alliance Mfg. Company, Chicago, will build a three-story factory on Clybourn avenue the cost of which is estimated at \$65,000.

The Mt. Vernon Car Mfg. Company, Mt. Vernon, Ill., suffered a loss of \$75,000 as the result of a fire which damaged considerably the older portion of the clear.

C. A. Parker, Toledo, Ohio, and J. D. Clark, Decatur, Ill., have under way negotiations for the building of a \$20.000 manufacturing plant at Decatur for the manufacture of the Miller automobile self-starting device. The Cownie Tanning Company, Des Moines, Iowa, is about to erect a four-story brick factory in that city to be approximately 90 by 130 ft. and to cost \$50,000. The Barry Mfg. Company, Muscatine, Iowa, has announced its intention to build a foundry 60 x 140 ft. of steel and concrete construction.

The National Wood Works, Sioux City, Iowa, will erect an addition to its plant. The building together with new machinery is estimated to cost \$30,000.

The Olmstead Gas Traction Company, Billings, Mont., is about to begin the erection of a new plant at Great Falls. The new factory will be of brick and con-A. Parker, Toledo, Ohio, and J. D. Clark, Decatur,

Great Falls. The new factory will be of brick and concrete construction 50 x 200 ft. Tractor engines will be

# Detroit

DETROIT, MICH., July 9, 1912.

The local machine tool market continues to exhibit The local machine tool market continues to exhibit a fair amount of activity, although Independence Day figured somewhat in breaking up the week's business. Sales of single tools predominated, but some larger requirements are reported. A number of the automobile plants are or will be shut down for a week or two for the purpose of allowing those employed in the mechanical departments a vacation and this period will be used in overhauling the machinery and installing some new equipment. Second hand machinery dealers report a fair volume of miscellaneous business with the market for woodworking tools picking up a trifle. market for woodworking tools picking up a trifle. Power equipment shows a fair movement, especially that of medium capacity. Foundries generally continue

that of medium capacity. Foundries generally continue well engaged.

The Chalmers Motor Company, Detroit, has completed plans for the immediate erection of, a four-story building 71 x 191 ft. of steel and concrete construction. The building will be used as an extension to the manufacturing and assembly buildings and with its equipment will involve an expenditure of \$150,000. Construction arrangements are also being made at this time for another building 60 x 400 to be built later.

The Poss Motor Truck Company, 506 Howard street, Detroit, has acquired a new factory at Euclid avenue and the Grand Trunk Railroad, which will enabe it to double its facilities. A considerable amount of new equipment will be required.

The plant of the Detroit Seamless Tube Company, Detroit, manufacturer of seamless steel tubing, was destroyed by fire July 2, entailing a loss estimated at \$300,000. A large part of the machinery destroyed is of special design. T. H. Simpson, general manager of the company, states that it is too early to say what will be done toward rebuilding the plant.

The receivers of the Pere Marquette Railroad have authorized the immediate construction of new roundhouses at Port Huron and Ludington, Mich., and the erection of a large coal handling plant at Saginaw, Mich.

The Armitage Enamel Leather Company, Detroit, well engaged. The Chalmers

Mich.

The Armitage Enamel Leather Company, Detroit, has been incorporated with \$10,000 capital stock to manufacture an imitation leather. Walter S. Gurd is the principal stockholder.

Officials of the Jackson Cushion Spring Company, Jackson, Mich., deny current reports to the effect that the company will move its plant to Detroit.

The Original Gas Engine Company, Lansing, Mich., has acquired the plant of the Capital Furniture Company, which has dissolved and is disposing of its machinery. The new building will be occupied as temporary quarters pending the construction of its new facrary quarters pending the construction of its new fac-

tory.

The Michigan Screw Company, Lansing, Mich., is enlarging its factory quarters and installing additional

The American Steam Pump Company, Saginaw, Mich., has filed articles of incorporation giving its capital stock at \$500,000. R. J. Armstrong of Detroit is among those interested. Manufacturing plans are not

yet available.
The Apex House Stove Company, Albion, Mich.,

stove manufacturer, has acquired a large factory in that city and will remodel it and install a considerable amount of new machinery.

village of Sunfield, Mich., is considering the The

The Village of Sunneld, Mich., is considering the installation of a waterworks plant.

The Menominee & Martinette Paper Company, Menominee, Mich., will shortly commence the erection of a new building 50 x 200 ft., to be used as an addition to its wood pulp plant.

The Ramsey-Alton Mfg. Company, Portland, Mich., chair manufacturer, has commenced the erection of extensive additions to its plant, including an addition to its manufacturing building 40 x 200 ft., two stories, an engine room 36 x 40 ft. and a cement dry kiln. Some new woodworking equipment will be installed.

The three-story plaster mill of the Grand Rapids Realty Company, Grand Rapids, Mich., was destroyed

engine room 36 x 40 ft. and a cement dry kiln. Some new woodworking equipment will be installed.

The three-story plaster mill of the Grand Rapids Realty Company, Grand Rapids, Mich., was destroyed by fire June 1, with a loss of \$25,000.

The Michigan Cold Storage Company, Saginaw, Mich., has approved plans for the construction of a new boiler house and machine room 50 x 42 ft., two stories.

The business of the Luxury Chair Company, Grand Rapids, Mich., has been acquired by E. A. Townsend and G. E. Price of Chicago. The new owners plan to rehabilitate the present factory and will erect an addition which will double its capacity.

The Austin Automobile Company, Grand Rapids, Mich., has been organized with a capital stock of \$500,000 and proposes to erect and equip a large automobile plant. Those interested include James E. and Walter S. Austin and George H. Davidson.

The J. B. Stone Company, Grand Rapids, Mich., has changed its name to the Clipper Belt Lacer Company and increased its capital stock from \$20,000 to \$50,000.

The Hemmeter Spark Gap Mfg. Company has been incorporated at Pontiac, Mich., with \$6,000 capital stock, to manufacture spark gaps and automobile accessories. H. C. Hemmeter is the principal stockhoder.

The Mohr Mfg. Company, Iona, Mich., has been incorporated with \$10,000 capital stock to manufacture an automatic saw of new design.

The plant of the Kalamazoo Enameling Tank Company, Kalamazoo, Mich., was damaged by fire to the extent of \$35,000 July 4. A considerable amount of machinery will have to be replaced.

The Glengarry Upholstering Company, Cadillac, Mich., is planning the erection of an addition which will double its capacity.

Weier & Hirr, Birmingham, Mich., are erecting a factory building 50 x 60 ft., three stories, and will equip it for the manufacture of delivery and farm wagons.

The F. W. & F. Carlisle Company, Battle Creek, Mich., has merged its business into a stock company, with \$2,500 capital stock. No extensions will be made at present.

# Cleveland

CLEVELAND, OHIO, July 9, 1912.

Business with machinery dealers was quite good during the week. A fair volume of small orders for during the week. A fair volume of small orders for new machines came out and a large amount of second hand machinery was sold. The outlook continues satisfactory. While no large inquiries are coming out there is a fair volume of scattered inquiry for lots of three or four machines. Railroads in this territory are buying more freely than for some time. While no lists of any size are coming from this source small orders are being placed for immediate requirements. There is a good demand from industrial plants for electric locomotives and industrial cars. Conditions in the foundry trade appear to be growing better. Some of the local jobbing foundries now have about all the work they can do.

can do.

The Cleveland Brass Mfg. Company, Cleveland, which has been incorporated with a capital stock of \$150,000 will succeed the Cleveland Brass & Bronze Company, manufacturer of plumbers brass goods and brass specialties. The company is erecting a large addition to its plant at 4606 Hamilton avenue. It will be of brick and steel construction 40 x 120 ft. and four

The Trumbull Steel Company, Warren, Ohio, recently organized with a capital stock of \$1,000,000 to manufacture tin plate, has awarded the contract for the erection of its buildings to the Riter-Conley Mfg. Company, Pittsburgh. The main building will be over 1000 ft. long and 80 ft. wide. There will be a tin house 70 x 500 ft.

and a boiler house and one or two other buildings. The erection work will start about October 1.

The Canton-Hughes Pump Company, Wooster Ohio, has been awarded a contract for three mill pumping engines to be installed at Findley, Ohio.

The Melvin-Lloyd Company, Youngstown, Ohio, has been incorporated with a capital stock of \$10,000. The new company will take charge of the foundry that has been operated in that city by George L. Lloyd. Charles P. Melvin has become associated in the business. The company will increase its foundry business and will take up the mountageture of patents. company will increase its foundry take up the manufacture of patents

The Textile Belting Company, Cleveland, Ohio, has been incorporated with a capital stock of \$100,000 by Louis Englander, Robert H. McKay and others to engage in the manufacture of belting.

The Council of Bellevue, Ohio, has passed an ordinance authorizing a vote on a bond issue of \$35,000 to build a new electric lighting plant.

An election will be held in Paulding, Ohio, July 23

on the question of issuing \$30,000 of bonds for enlarging the municipal electric light and water works plant.

The Ajax Mfg. Company, Cleveland, Ohio, has recently received an order from the Canadian Pacific Railroad for nine machines, including headers, bull-dozers, and hot sawing and burring machines.

A wood working plant will be established in Sciotoville, Ohio, by H. D. Bahner.

The directors of the Repubic Rubber Company, Youngstown, Ohio, have completed the erection of a large reclaiming plant. This is in addition to a five-story factory building now under construction. A stockholders' meeting will be held in August to vote on an increase in the capital stock from \$4,000,000 to \$10,000,000.

The Western Conduit Company, Youngstown, Ohio, has been incorporated with a capital stock of \$25,000 by Cecil D. Hine, C. A. Manchester, L. J. Campbell, Richard Garlick and W. E. Manning. This company is a subsidiary of the Youngstown Sheet & Tube Company. The concern was formerly located in Chicago but when taken over by the sheet and tube company the offices were moved to Youngstown. A manufacturing plant with a floor space of at least 50,000 sq. ft. will be erected. The company will manufacture electrical equipment such as insulation, tubing, etc. ment such as insulation, tubing, etc.

The Interstate Foundry Company, Cleveland, will enarge its plant by the erection of a new core department. The building will be a three-story structure of brick and mill construction, 40 x 145 ft.

The Sherwin-Williams Company, Cleveland, has an inquiry out for a 32 in. band saw, a 3 ft. radial drill, a 24 in. x 14 ft. engine lathe and a 10-ton chain block for shipment to its plant at Magdalena, Mexico.

A local dealer is figuring on an inquiry from the gle Mfg. Company, Cincinnati, Ohio, for lathes, Eagle Mfg. Company, Cincinnati, O shapers and some small tool equipment.

The American Grave Vault Company, Gailon, Ohio, has commenced the erection of an addition to its plant 45 x 80 ft., two stories.

The reorganization of the Athens Foundry & Machine Company, Athens, Ohio, has been completed by the election of the following officers: President, C. M. Conant; vice-president, J. Morris Hyde; secretary and treasurer, Pearl W. Helwig. The company's lines of products will be the same as those made by the old company. It will make mine cars, car wheels and do general machine and repair work. general machine and repair work.

The Venetian Marble Terra Cotta Company, Lima, Ohio, is a new incorporation with a capital stock of \$150,000. The company will manufacture marble terra cotta for decorative purposes. A plant will be erected. Everett Kellie is president and Dr. J. P. Poling is secretary and treasurer. retary and treasurer.

The Mt. Vernon Mfg. Company, Mt. Vernon, Ohio, has been formed to manufacture waste paper bales, sanitary dish pans and drinking fountains for poultry.

The Fremont Furnace Company, Fremont, Ohio, has been reorganized with a capital stock of \$50,000. The new officers are A. H. Jackson, president; T. C. Harris, vice president, J. H. Combs; secretary and general manager; B. B. Smith, treasurer. The company manufactures warm air furnaces. factures warm air furnaces,

The Saxon Mfg. Company has commenced operations in its new plant at 205 Cherry street, Toledo. The company manufactures automobile horns and acces-

City Engineer Arnold, New Philadelphia, Ohio, has prepared plans for the installation of a 2.000,000 gal. pumping engine in the municipal waterworks plant.

# Indianapolis

INDIANAPOLIS, IND., July 9, 1912.

Fred C. Gardner has been appointed receiver for the Atlas Engine Works, Indianapolis. The plant will be continued in operation as it has large contracts for Silent Knight motors and Diesel type of crude oil engines. The receivership is caused by the temporary suspension of payments by the company's largest customer. There has also been request for indefinite suspension of deliveries on other contracts.

The W. R. Drinkard Veneer Company, Indianapolis, has been incorporated with \$5,000 capital stock, to manufacture veneer. The directors are W. R. Drinkard, H. J. Barnard and M. Drinkard.

The Indiana School of Tractioneering, Laporte, Ind., a school of farm power engineering, has been incorporated with \$25,000 capital stock. The directors are A. J. Rumley, B. G. Baker and J. Wolf.

The Autox Paint Company, Indianapolis, has been incorporated with \$44,000 capital stock to manufacture paints, putty, oils, etc., The directors are Hugh M. Love, O. M. Ragsdale and H. H. Buckman, Jr.

The F. O. Smith Chair Company, Evansyille, Ind.

The E. Q. Smith Chair Company, Evansville, Ind., has increased its capital stock \$75,000.

The Curpatca Machine Company, Mishawaka, Ind., has been incorporated with \$15.000 capital stock, to do a general machine and repair business. The directors are A. O. Curtis, L. G. Patterson and R. F. Catton.

The Magic City Construction Company, Gary, Ind., has been incorporated with \$10,000 capital stock, to do a general construction business. The directors are A. Deutsch, A. E. Deutsch and W. S. Feuer.

The Railway Motor Car Company, Marion, Ind., has been incorporated with \$200,000 capital stock, to manufacture railway motor cars. The directors are W. P. Worth, J. D. Worth, H. Beshore, G. R. Stewart and Worth, J. D. Wo Eben H. Wolcott.

The Southern Indiana Petroleum Company, Evans ville, Ind., has been incorporated with \$35,000 capital stock to drill oil wells. The directors are J. H. Pauley, A. E. Geiss and O. G. Geiss.

A. E. Geiss and O. G. Geiss.

The Anchor Supply Company, Evansville, Ind., will build new shops having about 50,000 sq. ft. of floor space, including machine shops upon which an expenditure of \$50,000 is contemplated.

The Martin Tractor Company, Indianapolis, has been incorporated with a capital stock of \$350,000 to manufacture tractors. The directors are C. H. Martin, H. R. Richards and E. D. Moore.

George H. Bishop & Co., Lawrenceburg, Ind., hand saw manufacturers, are increasing the capacity of their plant by the addition of two three-story buildings, one 75 x 150 ft., the other 50 x 100 ft. They have also found it necessary to utilize one of their warehouses for manufacturing purposes. Practically all the necessary equipment has been purchased. usacturing purposes. Practica equipment has been purchased.

## Cincinnati

CINCINNATI, OHIO, July 9, 1912.

The smaller units of electrical equipment are in ex-The smaller units of electrical equipment are in excellent demand, and builders of generators, motors, as well as electrically driven grinding and drilling machines report a satisfactory run of both domestic and foreign orders. The machine tool situation is unchanged, but the export trade is holding up much better than was expected for this season of the year.

The boiler and tank business shows some improvement, and second-hand machinery dealers are also more optimistic over an increased number of inquiries.

The large lot of machine tools wanted by the Canadian Pacific Railway Company, for delivery at Wind-

nadian Pacific Railway Company, for delivery at Windsor, Ont., has not yet been closed, but the order is expected to be placed within the next few days. The following is the list of lathes being figured on by local washing tool builders. machine tool builders:

One 12-in. x 6-ft. tool room lathe with hollow spindle.
One 14-in. x 7-ft. 6-in. tool room lathe.
One 16-in. tool room lathe.
One 20-in. x 8-ft. tool room lathe.
One 16-in. automatic stud lathe.
Three 14-in. engine lathes, two to have 6-ft. bed, and one to ve 8-ft. bed, back geared.
Four 16-in. motor driven engine lathes with 8-ft. bed.
Three 16-in. back geared engine lathes, two with 6-ft. beds and e with 8-ft. bed.
Five 18-in. double back geared engine lathes, three with 6-ft. and

Five 18-in, double back geared engine lathes, three with 6-ft, and with 10-ft, beds, with three step cone pulley drive for wide

Seven 20-in. x 8-ft. engine lathes with quick change gears, three step cone pulley drive for wide belt.

One 24-in. back geared engine lathe with 10-ft. bed.

Three 26-in. engine lathes, one with 10-ft. and two with 12-ft.

Two heavy duty 30-in. x 12-ft motor driven back geared engine les, arranged with quick change gears.

One 32-in. x 16-ft. heavy duty triple geared engine lathe, 9 ft.

between centers.
Two heavy duty 36-in. x 14-ft, triple geared engine lathes, 7 ft. between centers.

The Allyn Engineering Company, Cincinnati, drawing up plans for a power house, and other additions to the plant of the Noyes Mfg. Company, Dayton,

The Globe Automatic Sprinkler Company, First National Bank Building, Cincinnati, recently mentioned as having leased the H. C. Hazen Company's plant on having leased the H. C. Hazen Company's plant on Reading road, will soon have its new quarters ready for occupancy. The company is now buying considerable occupancy. The company is now buying considerable equipment, included in which are a lot of small lathes and drilling machines.

The Grasselli Chemical Company, Cleveland, Ohio, has acquired a large tract of land near Lockland, a Cincinnati suburb, on which it plans to erect an immense fertilizer factory. Particulars are not now available as fertilizer factory. Particulars are not to the equipment that will be required.

Rapp, Zettel & Rapp, Johnston Building, Cincinnati, have been commissioned by the Gisholt Machine Company, Madison, Wis., to draw up plans for a 3-story fireproof pattern shop and storage building, 60 x 300 ft., to be erected adjoining the company's present plant. The American Water Motor Company, Columbus, Chica bear incorrected with \$5000 control storage and the storage storage and the

has been incorporated with \$20,000 capital stock. Llewellyn Lewis is named as one of the principal in-

corporators

The Allyn Engineering Company, Second National Bank Building, Cincinnati, is taking bids on the necessary power, heating and ventilating equipment to be installed in a new plant now under construction for the Milwaukee Corrugating Company, Milwaukee, Wis.

The Ideal Motor Car Company, Columbus, Ohio, has been incorporated with \$200,000 capital stock. Manufacturing plans have not yet been given out. C. G. Amendt and F. J. Shaffer are named among the incorporators.

corporators

Contract for the construction of the proposed Gibson Hotel, Cincinnati, has been let to the Wells Brothers Construction Company, Chicago, which expects to commence work at an early date. The new building will be 12 stories, and will require about 3000 tons of structural steel.

The River City Machine & Castings Company, Portsmouth. Ohio, has been incorporated with \$10,000 capital stock, by Charles Moritz, William F. Pfau and

## St. Louis

St. Louis, Mo., July 8, 1912.

There has been a slight slowing up of business in the machine tool market in the past ten days and the reports from this territory do not tell of many new enterprises, but optimistic conditions are general. The transactions recently have been mostly of the single tool character, but the past week brought out the big specifications of the Busch-Sulzer Bros.-Diesel Engine Company, prepared at the St. Louis headquarters and submitted to selected tool makers all over the country. This list has been expected for some time and its size is even larger than was anticipated for first requirements. The company, however, plans to install its equipment as construction work on the buildings proceeds and as construction work on the buildings proceeds and thus lose no time in getting ready for operations. It took formal title last week to the two city blocks which its plant will occupy, and the buildings are under way, the foundation work being well along. The ultimate ost of the plant and equipment will undoubtedly exceed \$500,000

### The Busch-Sulzer Bros.-Diesel Engine Company's List

The specifications call mostly for motor-driven machinery indicating that electricity will be the exclusive power of the plant—an interesting fact in the light of the proposal, through the Keokuk hydro-electric distribution system, to provide current at \$20 per kw. year. Following is a summary of have been submitted for bids: Following is of the specifications which

One geared head engine lathe, 18-in. swing-over, 4 ft. between

One geared head engine lathe, 18-in, swing-over, 4 ft. between

One geared head engine lathe, 20-in, swing-over, 4 ft. between

One geared head engine lathe, 22-in. awing-over, 5 ft. between

One geared head engine lathe, 22-in. swing-over, 5 ft. between

Two geared head engine lathes, 24-in. swing-over, 5 ft. between centers.

One geared head engine lathe, 31-in, swing-over, 8 ft. between centers.

One geared head engine lathe, 37-in, swing-over, 9 ft. between centers.

One geared head engine lathe, 49-in. swing-over, 20 ft. between centers

One turret lathe, for 3 in. in diameters, 36-in. length, 20 ft. be-One turret lathe, for 6 in. in diameters, hole 61/4 in. or larger, 20

ft. between centers One single spindle Gridley automatic lathe, for 21/4 x 7 in., reg-

equipment

One automatic lathe, 20-in. swing-over, 12-in. slide. One universal turret lathe for 16-in. work, chasing tool slide 51/4 in., length turned, 6 in.

Three single spindle, sensitive drilling machines, 91/2 in. to center, table 26 x 28 in

Two 2-spindle, sensitive drilling machines, 91/2 in. to center,

One 3-spindle sensitive drilling machine, 91/2 in. to center, table x 48 in.

Five upright drills, 2 21-in., 2 28-in., 1 -36-in., with table attach-

One 4-spindle gang drill for work up to 2 in

One multiple spindle drilling machine with 16 spindles for drilling up to 3/4 in. holes, 16 in cast iron and 16 up to 5/4 in. in steel, all at the same time.

One multiple-spindle drilling machine, up to 11/2 in. holes, to drill 16 holes in cast iron at the same time.

Five radial plain, radial drilling machines, 1 each with 3 ft., 4

and 6 ft. arm and 2 with 5 ft. arm.

One horizontal drilling machine, spindle diameter approximately 3¾ in., horizontal travel, 36 inches, vertical 8 to 9 feet, table 6 x 8 ft.

One vertical boring and turning mill, 38 in. diameter, 24 in. under cross rails, 35 in. under turret.

One vertical boring and turning mill, 42 in. diameter, 33 in.

One vertical boring and turning mill, 53 in. diameter, 40 in. under cross rail.

One vertical boring and turning mill, 62 in. diameter, 44 in. under cross rail.

One vertical boring and turning mill, 72 in. diameter, 44 in. under cross rail.

One vertical boring and turning mill, 144 in, diameter, 84 in, under cross rail.

One horizontal boring mill and drill, elevator spindle top; spindles 3 in. or larger, horizontal travel 24 inches, table 24x28 inches or larger, power feed.

Three planers, reversing, motor driven, 36 x 36 in. x 10 ft.

One planer, reversing, 48 x 48 in. x 12 ft. One planer, reversing, 72 x 72 in. x 16 ft. long.

One planer, reversing, 122 x 122 in. x 20 ft. long.
Five pillar shapers, 2 16-in., 2 20-in. and 1 24-in., all back geared.
One travelling head slotter, 15 to 18 in. with 18½-in. stroke.
One travelling head slotter, with 6-in. stroke.

One planer and milling machine, table 48 x 12 in. approximately,

automatic feed, 30 x 10 x 20 in. One universal milling machine, with table 40 x 10 in.

One vertical spindle milling machine with circular attachments, automatic feeds, 34 x 13 x 14 in.

One key seat milling machine for 1/2 in. up to 11/2 in. wide x 30 in.

cutting machine up to 11/2 x 12 in.

One cutting off and centering machine up to 6 in. One pipe cutting and turning machine 1/4 in. up to 2 in.

One pipe cutting and turning machine, 11/4 in. up to 6 in.

Three circular grinding planing machines, capacity 6 in., 10 in.

and 20 in. respectively.

One universal tool grinding machine, 2 to 21/2 in. capacity. One dry drill grinding machine, capacity 5/16 to 3 in

Three wet grinding machines with wheels of 24-in. dis. and 2-in. face.

One universal tool and cutter grinder, 12 in swing over, with 36 in distance to grind cutters; 14 in diameter by 3 in wide capacity.

One surface grinding machine 18 x 6 x 91/2 in. high

One 48-in. standard measuring mac'ine.

One vertical surface grinder, table 20 in. x 6 ft., from table to face of wheel 17 in. and travel of table 6 ft.

One adjustable rail milling machine, 36 x 36 in. x 10 ft.
One bench lathe, swing 7 x 8 in., distance between centers,

One No. 2 gear shaper, 36-in. pitch diameter, 5-in. face to

of saw 20 to 24 in.

cut up to 4-in, diameter of pitch.

One metal sawing machine up to 61/4-in, round bars, diameter

One metal sawing machine and shaper, capacity of saws up to

One spiral gear machine, capacity of spiral gear, 24 in. diameter, 6-in. face, 2-in. pitch.

One No. 2 polishing lathe, column spindle, type B, 11/4-in. bearing, 1-in. flanges, 36 in. long.

One No. 4 polishing lathe, 11/2 in. diameter, 11/4-in. flanges, 52 in. long.

One belt strapping drilling machine, bed 72 in. long, diameter spindle boring 1 7/16 in., flanges 1 1/4 in.

One planer double disc grinder, discs up to 18 in. diameter.
Two swing cut-off saws, table 14 ft., saws up to 18 in.
One 4-roll double surfacer, planing 24 x 8 in.
A universal saw bench with 16-in. rip and cut-off saws, table 41 44 in.

One heavy band saw, metal wheels, 38 in. diameter, tables 36

One left hand heavy band saw, metal wheels, 36 in. diameter,

One planer and jointer, capacity up to 6 in. wide. One heavy turning lathe, 32-in. swing over bed, 28 in. over carriage, 8 ft. 6 in. between centers, 84 in. to outer end of spindle.

One pattern makers' lathe, swing over bed 16 in., 13 in. over

and 7 ft. 3 in. between centers

One head stock speed lathe, swing 12 in., turn 24 in. between

One No. 482B revolving oil stone universal grinder, 2 wheels,

One 3-in. grinding cone, 3 in. diameter, 5 in. long. One emery wheel, 10 in. diameter, 1 in. face.

One tool holder, knife grinding attachment for knives 30 in.

Four bench trimmers, stroke 8 in., depth of cut 4¾ in. Eight pattern makers' benches, 8 ft. long, 30 in. wide.

One No. 476B high embossing machine for letters 3/6 in. high.

One No. 476B high embossing machine for letters ¾ in. high. Four electric glue heaters, 1 qt. size.

One electric glue heater, 3 gal. size.
One pattern makers' double disc grinder, complete; two 30-inch

One No. 42 core box machine, regular equipment.

One portable boring and milling machine, spindle 6 to 7 in. diameter, horizontal feed, 8 ft.

One portable hand milling machine, 13 in. under arm, vertical adjustment 17 in., distance to spindle 13 to 14 in., side adjustment, 4 in.

The Big Four Lumber Company, St. Louis, with \$50,000 capital stock, has been incorporated by John C. McLachlin, Orin T. Pearson and E. Bayless to equip and operate planing mill and lumber working plant.

The Van Cleave Saw Mill Company, St. \$100,000 capital stock, has been incorporated by P. F. Jolly, T. E. Powe, F. C. Harrington and Granville Hogan to operate and lease lumber mills.

The Mound City Box Factory, St. Louis, has been incorporated with \$50,000 capital stock by James C. Jones, Fred P. and Frank E. Wichard and others to

The Elliott & Barry Engineering Company, St. Louis, has been awarded the contract for the heating apparatus for the new high school building being erected in East St. Louis, Ill.

The Durbin Train Type Connector Company, St. Louis, of which V. S. Durbin is president, proposes to build a factory in that city to cost \$75,000.

The Gate City Mfg. Company, Omaha, Neb., has been reorganized with a capital stock of \$100,000 and will build a factory, affording from 12,000 to 15,000 sq. ft. of floor space.

## The Central South

LOUISVILLE, KY., July 9, 1912.

While business the past week has been somewhat interfered with by the holiday as well as by the completion of semi-annual inventories, both of which prevented the usual volume of business from being handled, manufacturers and dealers report the immediate outlook satisfactory. Prospects for future business are somewhat indefinite, but it is believed that trade will develop favorably. Meanwhile factories are all busy in this section, and that means that consumption of equipthis section, and that means that consumption of equip-ment ought to remain normal. Machinery for large ment ought to remain normal. Machinery for large buildings which are being planned or are under con-struction continues to be a marked feature of present

and prospective trade.

The Louisville Board of Education has let several contracts for the installation of heating plants in local schools. Among those who will install this equipment are R. I. Anderson & Co., F. A. Clegg & Co., and F. S. Schardein & Son, all of Louisville.

The Clark Motor Car Company, Louisville, has arranged for the erection of a new building and will increase its capital stock from \$30,000 to \$60,000. A large repair shop will be equipped at the new quarters, and machine tool purchases will be made in the near future.

J. D. Wright is the Louisville representative of Chicago interests which will erect a 14-story office building at Fifth and Green streets, Louisville. H. Wolters, Louisville, is the architect. It will be a steel-frame structure. Preliminary plans call for the installation of three elevators.

The American Metallic Packing Company, Lexington, Ky., will purchase a used 7-ft. band-saw mill, including power plant. The company is also in the market for rails and other material for a logging road.

The Dean-Jellico Coal Company, Barbourville, Ky, I install an electrically operated mining plant on Brush creek at a cost of \$40,000.

G. C. Davis, Brookport, Ill., is erecting a grain elevator of considerable capacity. The contract for the building has been let. The Paducah Milling Company, building has been let. Paducah, is interested.

D. H. Burnham & Co., Chicago, will open bids July 12 in that city for the erection of the Starks Building, which will be put up at Fourth and Walnut streets, Louisville. The building will be equipped with power and lighting plant and several elevators

The construction of a water-power plant on the Cumberland River near Williamsburg, Ky., by H. M. Byllesby & Co., of Chicago, is believed to be a matter of the immediate future, as recent statements of that company have indicated that the plan, which has been under consideration for some time, has been definitely approved.

The Southern Sheet & Tin Plate Company, Ashland, Ky., has been organized with \$50,000 capital stock by E. J. Job, J. W. Job and D. M. Job.

The Clinton Water & Light Company, Clinton, Ky., has been incorporated with \$15,000 capital stock by Thomas Emerson, J. L. V. Grenier and P. H. Porter.

The E. H. Taylor, Jr., & Sons Company, Frankfort, Ky., has increased its capital stock from \$250,000 to \$1,000,000. The company is planning to make a large number of improvements in its plant.

The Roberts Oil Company, Memphis, Tenn., has purchased two large cotton gins at Hickman, Ky., and has announced that it will erect a large cotton oil mill there. The business will be conducted under the name of the Hickman Cotton Oil & Ginning Company, with a capital stock of \$50,000.

The East Tennessee Cotton Oil Company, Hickman, Ky., has been formed and will erect a large cotton oil mill.

The wood-working factory and blacksmith shop of Ross Bros., Columbus, Ind., were recently burned with Decision as to rebuilding will be made \$15,000 loss. shortly.

The J. M. Hecht Brass Works, Chicago, will establish a plant in Chattanooga, Tenn., it is reported, for the manufacture of light shelf hardware of brass, bronze and aluminum.

The Wheeling Corrugating Company, Wheeling, W Va., is erecting a building at Chattanooga, Tenn., for the manufacture of metal corrugating material. Tenn., for

The Seaton Wheel Company, Nashville, Tenn., has been incorporated with \$130,000 for the manufacture of a patented automobile wheel. The incorporators are Granberry Jackson, Samuel S. Lord, B. C. Seaton and others.

The Conservation Marble Company, Lenoir City, Tenn., is planning the opening of a quarry for the development of marble deposits. The equipment will be electrically operated. A. C. Nickerson, Knoxville,

velopment of marble deposits. The equipment will be electrically operated. A. C. Nickerson, Knoxville, Tenn., is president of the company.

The Tennessee Eastern Power Company has been formed at Chattanooga, Tenn., with \$40,000 by G. C. Lancaster, L. N. Spears and Lewis M. Coleman.

The Duck River Power Company, Shelbyville. Tenn., which is enlarging its plant, has contracted for the installation of two engines of large capacity, manufactured by the Chuse Engine & Mfg. Company, Mattoon, Ill. toon, Ill.

The Knoxville Railway & Light Company, Knoxville, Tenn., has begun the erection of a new powerhouse at Sixth avenue and the Southern Railway. The building will be of reinforced concrete and brick.

J. K. White, Gallatin, Tenn., is establishing an automobile garage and repair shop and will be in the market.

mobile garage and repair shop and will be in the market for several machine tools.

C. Kefauver, Madisonville, Tenn., is asking for

quotations on a deep-weil pump.

The Grasselli Chemical Company, New Market,
Tenn., is installing additional machinery for the de-

relopment of its extensive zinc properties. A 40-ton crane was recently purchased.

Plans for the new passenger station and office building of the Illinois Central Railroad at Memphis, Tenn., here been submitted to the city authorities. The building of the state of the city authorities. have been submitted to the city authorities. The bing will be 10 stories, of steel frame construction. large amount of equipment will be needed, as well as material to be used in the construction of the elevated tracks. The cost of the building will be \$2,500,000. D. J. Brumley, Chicago, is engineer of construction of the Illinois Central.

Illinois Central.

A company is being organized in Nashville, Tenn., for the erection of a large hardwood flooring mill. C. L. McConnell, of the Ransom Hardwood Flooring Company, is mentioned as one of those interested.

The Weidner Boiler Company, Chattanooga, Tenn., has completed the delivery of boilers to the L. E. White Lumber Company, San Francisco, Cal., for installation in a new plant on the coast of California.

W. C. Houston, R. D. Swann and Charles Houston have purchased the control of the Southern Mill Sup-

have purchased the control of the Southern Mill Sup-ply Company, Nashville, Tenn. The business will be

ply Company, Nashville, Tenn. The business will be continued without change.

The Oakland Motor Company is installing a factory branch at Nashville, Tenn., in charge of M. D. Stone. A repair shop of considerable size will be equipped.

O. H. Viall, Elizabethton, Tenn., is head of a large company which is being organized for the purpose of erecting a band-mill and planing-mill at Waynesville, N. C., where a large timber tract has been secured.

The Pilot Mountain Mfg. Company has been formed in Morgan County. Tenn. near Harriman, and will erect

in Morgan County, Tenn., near Harriman, and will erect a large sawmilling plant for the development of the timber which it has recently acquired.

The Logansport Radiator Company, Logansport, Ind., is reported as considering the establishment of a plant at Chattanooga, Tenn. James F. Digan is president of the company.

dent of the company,
H. A. Tagatz, of the United States Mfg. Company,
Lena, Wis., is considering the erection of an interior
finish plan and planing-mill at some point in the Cen-

Henry & S. G. Lindeman, piano manufacturers of New York, are reported to be considering the erection of a branch factory in Atlanta, Ga. The Cleveland-Manning Company, of Atlanta, will be interested in

## Birmingham

BIRMINGHAM, ALA., July 8, 1912.

The second half of the year has opened well with the machinery trade. Mill supplies of all kinds are going nicely and machinery is in demand. The June business was better than the average for that month. The outlook is considered as a rule to be very good, especially with the saw mill and mill supply trades. Sales of machinery have been satisfactory and so have inquiries. The repair machinery shops have been especially busy, an item which of itself presages good business in new appliances.

The Consumers Ice Company, Tampa, Fla., has let

The Consumers Ice Company, Tampa, Fla., has let a contract for a five story cold storage building of reinforced concrete, to McGucken and Hyer.

The Arlington Lumber Company, Arlington, Ga., will erect a plant with a daily capacity of 40,000 ft. of yellow pine flooring and will install \$10,000 worth of machinery.

machinery. Rousch Wagon & Machine Works, Leesburg, Fla.,

Rousch Wagon & Machine Works, Leesburg, Fla., will install additional machinery, etc.

The Pratt Lumber Company. Brunswick, Ga., has been incorporated and will establish an extensive saw mill. G. H. Cook and Millard Reese, of Brunswick, and C. L. Pratt, of Jacksonville, Fla., are the incorporators. Bids will be received until August to by the Board of Drainage Commissioners of Florida, J. C. Luning, secretary, Tallahassee, for excavating drainage canals near Pompano, Larkin and Fulton, Fla. J. O. Wright, chief drainage engineer, Tallahassee.

C. W. Hunt & Co. will install machinery on their docks at Tampa, Fla., that will enable them to discharge coal at the rate of 750 tons a day, the present capacity being 300 tons.

capacity being 300 tons.

The Holland Gin Company, Boston, Ga., has been chartered by O. P. Ealton and others.

W. T. Spradley, W. C. Griggs and others are organizing to establish a fertilizer factory at Unadilla,

It is reported at Florence, Ala., that the capacity of the oil mill of the Farmers Feed, Fertilizer & Gin Company will be doubled.

H. D. Ussery and others will establish at Prattville, Ala., a plant for the manufacture of jugs, jars, flower nots etc.

pots, etc.

B. M. Kinser, who bought concrete block plant of J. T. Lewis and Co. at Eustis, Fla., will install machinery for manufacture of plain and ornamental brick, sidewalk tile, fence posts, etc.

A company is being organized by G. H. Kelly and

A company is being organized by G. H. Kelly and associates at Gainesville, Fla., for the establishment of a plant to make an automatic starter for automobiles.

The planing mill and chair factory of John W. Wolcott at Griffin, Ga., burned with a loss of \$10,000.

The main building of the sawmill and veneering plant of R. H. Benner & Co., at Mobile, Ala., burned.

## Texas

Austin, Texas, July 6, 1912.

There is little change in the machinery trade situation from last week. This is the hight of the busy season with the farmer. Beyond the demand that comes for the installation of new irrigation pumping plants there is little trade in the farming communities. Building activity in its various lines is keeping up remarkably well. There is no indication of a falling off at any time during the summer.

The electric light plant at Trigity, owned by A. R.

The electric light plant at Trinity, owned by A.

The electric light plant at Trinity, owned by A. R. McDonald, which was recently destroyed by fire, will be replaced by a new plant.

The Cotulla Reservoir & Irrigation Company, Cotulla, Texas, which was recently organized, will construct a system of irrigation that will water about 225,000 acres of land in South Texas. Three large storage reservoirs will be formed by the construction of dams. Matthew Russell of Cotulla is president of the company. Judge Noah Allen of Brownsville is promoting the establishment of an irrigation district in the valley of the San Saba River near San Saba, and the construction of a system of irrigation that will water about 50,000 acres of land.

The Texas Office Machinery Company, San Antonio,

The Texas Office Machinery Company, San Antonio, has been organized with a capital stock of \$5,000. The incorporators are W. C. Braff, J. P. Ward and Leslie

The Pierce-Fordyce Oil Association is enlarging its oil refinery at Texas City by the installation of two new stills and the erection of several large storage tanks.

The City Council has formally ratified the sale of the

Temple Light & Power Company's plant and other holdings at Temple to the Texas Light & Power Com-

pany.

The Harwood Gin Company, Luling, Texas, has been organized with a capital stock of \$6,000. The incorporators are W. G. Bouldin, Jr., E. C. Marshall, R. A. Mc-

tors are W. G. Bouldin, Jr., E. C. Marshan, R. T.
Donald and others.

The Bowers Southern Dredging Company is installing new machine shops on Pelican Island, near Galveston. It will also construct a marine ways upon the island and otherwise enlarge its plant there.

The Mountcastle Land & Irrigation Company is preparing to greatly enlarge its irrigation system. It will install pumps and other machinery at Toyanvale.

The Grossman Company, Inc., Dallas, has been formed with a capital stock of \$50,000 for the purpose of manufacturing soda water apparatus. The incorporamanufacturing soda water apparatus. The incorpora-tors are H. Grossman, M. Grossman and Fred E. Ech-

man.

The Uvalde Wax Company, Uvalde, which has been organized with a capital stock of \$20,000, will install a plant for the manufacture of wax from the candeilla weed. The incorporators are Donald Campbell, W. B. Tiner and B. Y. Sharp.

El Fresnal Irrigated Land Company will construct a system of irrigation near San Benito. S. A. Robertson of San Benito is interested.

The Howard Water & Light Company, Howard, has been organized for the purpose of installing a waterworks system and an electric light plant. The incorporators are J. T. Murphy, W. R. Woods, J. S. Robinson and others.

and others.

The Mineral Wells Crushed Stone Company, which has a capital stock of \$20,000, will install a stone crushing plant at Mineral Wells. Those interested are J. H. McCracken, L. N. Brewster, J. T. Moore and

others.

The Planters Gin Company will install a cotton gin at Rosenberg. Those interested are George R. Hallmann, J. J. Bramlett and O. H. Gatton.

F. Eiring will install an irrigation pumping plant near Plainview.

C. S. Eberling will construct a system of irrigation and install a pumping plant upon his land near Plain-

The Tamalina Milling Company is erecting the first of four reinforced concrete grain elevators at San Antonio. Each elevator will have a capacity of 1000 bushels of corn. J. C. Dielman of San Antonio has the contract.

The Malone Farmers Gin Company will install a cotton gin at Malone, at a cost of about \$10,000. H. L. Dawson is president of the company.

The Devol Mineral Ice Company will enlarge its ice plant at Artesia, N. M.
H. Bencini of Fort Worth and associates will in-

stall an 80-ton hydraulic process cotton-seed oil mill at San Benito, Texas.

The Kansas City, Mexico & Orient Railroad will soon begin the removal of its shops from Sweetwater to San Angelo.

# The Pacific Coast

SAN FRANCISCO, CAL., July 2, 1912.

The local machine tool market continues to drag. the single tool orders are coming out all the time, there is a little business from the Hawaiian Islands, but on the whole the volume is not much greater than at any time in the last year. Numerous small inquiries are coming from country shops, but most of them are satisfied with second-hand tools, of which there is still a large supply.

there is still a large supply.

Notwithstanding the expectation of an increasing shipbuilding business, Pacific coast concerns still appear unable to compete with those on the Atlantic for large contracts, as indicated by the letting of a steamer contract by the Matson Navigation Company to the Newport News Shipbuilding Company last week at \$1,350,000. The owners were disposed to favor Pacific coast firms to the extent of \$50,000, but the bids of the Union Iron Works and the Seattle Drydock & Construction Company exceeded the figure accepted by \$175,000 and \$125,000 respectively. Pacific shops, however, are keeping fairly busy on small construction and repair work. work

work.

Little business is developing in woodworking machinery, but many orders are still being placed for general contractors' equipment, and conditions are favorable to continued activity. Next summer is expected to bring a further increase in this line, as the principal work on the State road improvement programme will then be under way, and construction of the Exposition buildings will require considerable machinery, in addition to the further requirements of power development.

The C. L. Best Gas Traction Company, San Leandro, Cal., is starting work on another new building, and will put in an annealing oven, the present capacity of the steel foundry plant being fully occupied. A new crane has just been completed.

The Paauhau Sugar Plantation, Hawaii, has ordered another Dietrich & Harvey planer, 30 in. x 8 ft., with an 8-ft. supplementary rolling table.

The Mound House Plaster Company is installing a new outfit of automatic feeders and mixers at its plant,

new outfit of automatic feeders and mixers at its plant, Emeryville, Cal.

Emeryville, Cal.

The San Diego, Consolidated Gas & Electric Company, San Diego, Cal., has made an industrial track installation consisting of Koppel steel tie track and double side dump cars, for handling coal at their gas works.

The Joseph Reid Gas Engine Company, Los Angeles, has been incorporated with a capital stock of \$10,000 by S. R. Shoup, A. B. Ritchey and G. G. Murry.

The Star Drilling Machine Company is preparing to put up a plant at Long Beach. Cal.

put up a plant at Long Beach, Cal.

The Enterprise Foundry Company is building an addition to its new plant at Richmond, Cal., for the man-

Langford, Bacon & Myers have purchased the business of the Foote Concrete Machinery Company, and opened salesrooms at 215 Rialto Building.

The Santa Fé Foundry Company of California, San Francisco, has been incorporated with a capital stock of \$50,000 by J. W. Mason, J. C. Owens, G. W. Penning and G. C. Gross.

The Hammon Construction Company working on

and G. C. Gross.

The Hammon Construction Company, working on the jetty at Eureka, Cal., is still increasing its equipment, having recently received a locomotive, a crane and electric hoist. It is reported that the company will open another quarry in that vicinity.

The Towle Bros. Lumber Company is preparing to put up a new sawmill near Quincy, Cal.

The American Writing Machine Company will shortly install a typewriter rebuilding factory at Los Angeles.

The machine shop of the American Tool & Specialty Company, Los Angeles, suffered a fire loss of nearly \$4,000 on June 21.

Frequent reports have come from Los Angeles re-cently of a new steel manufacturing project, said to be backed by important oil interests, but no definite infor-mation on the matter is available here. The Western Pacific Railroad plans to complete its

shops at Sacramento, Cal., at an early date. Work was suspended over a year ago.

The Ford Motor Car Company has arranged to purchase a block of land at Twenty-first and Harrison streets as a site for its San Francisco assembling plant.

The Board of Public Works of Los Angeles has authorized the organization of a sales department for disposing of old material and equipment, from the Owens River project. The material to be sold includes steam and electric shovels, wagons, drills, compressors, forges,

electrical equipment, etc.

Preliminary plans have been completed for the new manual training school at Oakland, Cal. The building will be of steel and concrete, with a foundry and large machine and woodworking shops in separate buildings.

# Eastern Canada

TORONTO, ONT., July 6, 1912.

Trade could hardly be more satisfactory than it is at present. All the manufacturers are busy up to their full capacity, and most of them have work in hand to the capacity, and most of them have work in hand to keep them going at the same rate for months ahead. The harvest prospects, the farm prospects as a whole are most cheering. There is every reason to expect the agricultural, mineral and other natural industry production of the present year to leave all former records far behind. The banks are showing confidence in the situation, and while making provisions for a in the situation, and while making provisions for a large grain movement in the early future, they are not now stinting manufacturing customers. Competition now stinting manufacturing customers. Competition from other countries continues to be very strong, but there seems enough for all. Some Canadian manufacturers say they find United States competitors less reckless about prices than they were some time ago. Everybody expects that this year's wealth production in Canada will put fresh confidence in British investors and cause their capital to flow in more freely than ever to help build railroads and other permanent development work. ment work.

ment work.

The Augustine Rotary Engine Company agrees to build a \$100,000 factory in St. Thomas, Ont., and employ 300 men, if the city will give it a loan of \$5,000, and certain municipal privileges.

The Esperito Santo Chartered Company, a \$5,000,000 concern, with headquarters in Toronto, has been incorporated by letters patent through a Toronto law office. The powers are those of a railway, shipping, mining and development company.

The Dominion Steel Casting Company, Hamilton, has been incorporated, with a capital stock of \$500,000.

The Ontario Power Company, Niagara Falls, Ont., is to extend its station during the present season approximately 90 ft. for two more units. The extension, together with the necessary equipment, will involve an expenditure of about \$600,000, and will mean much to the growth of the Niagara frontier in the furnishing of power to new industries and the outlay of money for machinery and materials and the employment of highmachinery and materials and the employment of high-class mechanicians and labor. The two new generating units are to be built for a normal rated output of 13,000 electrical hp. each. The turbines connected to each generator are to be constructed for a maximum of 18,000 hp. These will be the largest turbines, and the units, as a whole, will have the greatest output of any at Niagara Falls.

at Niagara Falls.

The largest and most important factory proposition ever submitted in Berlin, Ont., was enthusiastically indorsed at a joint meeting of the City Council and Board of Trade Council. It provides for the erection of a factory in Berlin by the Consolidated Rubber Company, Ltd., for the manufacture of automobile tires, entailing an expenditure of \$250,000 on buildings and equipment and to employ before the end of the first year's ing an expenditure of \$250,000 on buildings and equipment and to employ before the end of the first year's operations 150 skilled male mechanics and 250 at the end of the second year. A condition is that the rate-payers pass a by-law granting a bonus of \$25,000 for the purpose of acquiring a site of 15 acres and fixed assessment of \$25,000 for a period of 10 years.

M. J. O'Brien, of Renfrew, has acquired a large tract of timber limits near Quinze Lake and Lake Ex-

panse, and, it is understood, he will build a 400-ton per day pulp mill, utilizing the enormous water powers on Quinze Lake to operate it. This will be the first big pulp mill in Northern Ontario.

Mayor Schmalz, of Berlin, Ont., has received a communication from John Walter, of Chicago, who has been in the city recently with a view to establishing a wood fiber manufactory, stating that he is shipping his machinery to Berlin. He has secured premises in Berlin.

A start has been made upon the plant of the National Tube Company at Fort William, Ont.
The Canadian Steel Foundries' new plant at Longue Pointe, Que., is about to commence operations. This concern, which is one of the subsidiary companies of the Canadian Car & Foundry Company, will be a factor of considerable importance in the manufacturing of cars. as it will be the largest producer of steel castings in

The announcement that the Dominion Government proposed through its grain commission to creet a 3,000,000 bushel grain elevator at Fort William has brought to Ottawa the representatives of several construction companies in Canada and Canadian branches of United States construction companies, as well as written requests from the biggest plants in the United States.

The Galt Screw Machine Company, Ltd., Galt, Ont., has been incorporated to do a general manufacturing business, by Chauncey E. A. Dowler, Fred A. Palmer and Richard W. Roelofson. The company will have a capital stock of \$50,000.

The Canadian Steel Foundries, Ltd., Welland, Ont., is having plans completed for a new power house of brick and steel construction which it will add to its plant this summer. The equipment will include 500 hp. boilers; two or three motor generator sets, additions to switchboard equipment; air compressors, etc. The company has a 65 x 100 ft. addition to its rolling mill nearly completed.

The Page-Hersey Iron, Tube & Lead Company, Ltd., manufacturer of wrought iron pipe, Welland, Ont., is building a new pattern shop 40 x 60 ft., and a pattern storage building 40 x 60 ft. It is also building a 150 ft. extension to its electric crane runway to serve the skelp storage yard, and in addition it is installing a testing station. testing station.

The Welland Machine & Foundries Company, Ltd., Welland, Ont., William Edestrand, manager, manufacturer of hoisting engines, gasoline engines, etc., is building an addition to its foundry and a pattern shop and pattern storage building; also a paint shop and warehouse for the gasoline engine department.

house for the gasoline engine department.

The Canada Forge Company, Ltd., Welland, Ont., has just installed a 500-ton hydraulic press built by the William Tod Company, Youngstown, Ohio. This is the first power hydraulic press for this capacity for forge work put in use in this country. Furnaces to go with this press and a 10-ton electric crane to serve it were also installed. The company has also added a new 2000-lb. steam hammer and some further tool equipment will be placed later in the summer.

John Goodwillie & Son Welland, Ont. are building

John Goodwillie & Son, Welland, Ont., are building a canning factory 300 x 300 ft., two stories, of brick and concrete construction. A large amount of canning machinery and equipment will be required.

M. Beatty & Sons, Ltd., Welland, Ont., manufacturers of dredges, etc., expect to add some new machinery to their plant during the summer; to consist principally of lathes and drills.

Arrangements are being perfected for the merging of the Dain Mfg. Company, Welland, Ont., with the John Deere Company, the Canadian branch of the Deere Company, of Moline, Ill., and for the extensive enlargement of the Dain company's plant which is located on the Welland Canal and Grand Trunk Railroad, to provide resulting facilities for the Deere company's vide manufacturing facilities for the Deere Canadian business.

The Sarnia Gas & Electric Light Company's power plant at Sarnia, Ont., was destroyed by fire. The plant was installed seven years ago, and was valued at

The Pollard Mfg. Company, Niagara Falls, Ont., has been incorporated with a capital stock of \$50,000 and will establish a plant for the manufacture of machinery. The provisional directors are Edson T. Pollard, George G. Durham and William B. Masters. been incorporated

The St. Lawrence Starch Company is having plans prepared for a factory 100 x 480 ft., 5 stories, which it will erect at Port Credit, Ont., to cost approximately \$150,000.

The Gutta Percha Rubber Company, Toronto, will rect a two-story factory on O'Hara avenue, to cost \$15,000.

The Hupp Motor Car Company is building an addition to its Canadian branch plant at Windsor, Ont., and will install new equipment. The approximate cost will be \$15,000.

# Western Canada

WINNIPEG, MAN., July 5, 1912.

Refreshing rains throughout the country this week have improved crop prospects a great deal, and there is a confident tone in industrial circles. The wholesale machinery men report a steady demand for the various lines. The volume of trade during June was considerably larger than in the corresponding month of last year. Collections are estimated for the time of year.

The Pittsburgh Coal Company will build an elevator for handling coal in Winnipeg, at a cost of \$15,000.

The sawmill of the Rat Portage Lumber Company, Ltd., Kenora, burned a few days ago, with a loss of \$100,000, largely covered by insurance. It will be rebuilt at once

built at once. built at once.

The secretary of the Board of Trade, Edmonton, Alberta, announces that the Western Foundry & Machinery Company has been organized to manufacture gasoline engines there. The principal of the industry is Benjamin Olson, formerly of Toronto.

The Keystone Portland Cement Company, Calgary, is reported preparing to establish a factory at Blairmore, Alberta, to cost \$400,000. There will be a power house in connection with it.

A nine-story office block is to be built in Edmonton, Alberta, by Kenneth MacLeod. The architect is John R. Dow, Edmonton. It will have all modern equipment in heating, lighting, elevators, etc., and will cost about \$500,000.

The Dominion Fire Proofing Company, Ltd., Medicine Hat, Alberta, has been incorporated with stock of \$300,000, to build a factory there. Overpack, of Medicine Hat, is interested. The Finger Lumber Company, Le Pas, with a

The Finger Lumber Company, Le Pas, Man., is having plans prepared to double the capacity of its sawmill at that place.

The Canadian Stock Food Company is starting to build a factory at Moose Jaw, Sask.

A. C. Von Hagen, president of the United Flour Mills Company, Minneapolis, Minn., is negotiating with the City Council of Regina, Sask., to build a large flour mill there.

mill there. The Dry Dock & Shipping Company, Port Arthur,

Ont., intends constructing a power house Construction work has been commenced at Granby

The Dry Dock & Shipping Company, Port Arthur, Ont., intends constructing a power house
Construction work has been commenced at Granby Bay, B. C., on the 2000-ton custom smelter of the Granby Consolidated Mining & Smelting Company. The estimated cost is \$1,700,000.

The Machinery Exchange proposes to establish in the Canadian West a plant for the manufacture of electric freight and passenger elevators.

The establishment of large machine works on Lulu Island, near New Westminster, B. C., is contemplated by the Heaps Engineering Works.

The suggestion that the city of Calgary sell 13 acres of land in the industrial tract, east of the city, to the Alberta Interurban Railway Company on which to establish its car repairing shops, was discussed at a meeting of the legislative committee of the City Council on Wednesday night.

The building permit has been issued and work commenced on the \$200,000 plant of the Canada Malting Company in East Calgary, Alberta. The buildings are to be spread over a full quarter-section of land, the particular quarter-section being the southwest quarter of section 12, East Calgary.

Twenty per cent. of the actual construction work has been completed at the 1500-barrel plant of the Edmonton Portland Cement Company, Ltd., incorporated with a capital stock of \$1,500,000, and there is every reason to believe that the mill will be in operation the latter part of September or early in October, at the least, employing 130 men. It is expected the output of the mill, estimated at from 1000 to 1200 barrels a day, will be used in Edmonton and the surrounding districts.

The International Milling Company at Port Mann, B. C., has secured a site on the water front for terminal elevators and a flouring mill which will cost \$1,000,000, and a large English concern has made application for a site on the water front on which to estabish a dry dock and shipbuilding yard.

# Trade Publications

High Grade Steels.—Colonial Steel Company, 324 Fourth avenue, Pittsburgh, Pa. Catalogue No. 11. Contains descriptions of tool, alloy and other special steels manufactured by this company, with methods of treatment, price list and other useful information. For convenience in locating the various kinds of steels and other subjects treated in the catalogue a thumb index is used.

Multiple-Spindle Drilling Machine.—National Automatic Tool Company, Richmond, Ind. Catalogue No. 36. Concerned with the Natco automatic and adjustable multiple-spindle, multiple-speed, vertical and horizontal drilling machines arranged for drilling, reaming and tapping.

Pyrometers.—Brown Instrument Company, Philadelphia, Pa. Catalogue No. 8. Refers to a line of indicating and recording pyrometers which is said to be the most complete in the world. The catalogue is divided into two sections, the first listing the various types of electric instruments while the other treats of expansion, mercurial and other types of pyrometers.

Engine Lathe.—Boye & Emmes Machine Tool Company, successors to Schumacher & Boye, 2245 Spring Grove avenue, Cincinnati, Ohio. Circular. Illustrates and describes an 18-in. instantaneous change gear engine lathe which is equipped with double back gears and a double plate apron.

Pumping Engines.—Standard Pump & Engine Company, Cleveland, Ohio. Catalogue No. 12. Supersedes all previous editions and calls attention to a line of pumping engines and water supply systems operated by either gas or gasoline engines, electric motors or hand power for pumping from deep and shallow wells, cisterns, lakes, rivers, etc.

Corliss Engines.—A. L. Ide & Sons, Springfield, Ill. Bulletin No. 20. Gives brief description and specifications for the Ideal Corliss valve engine and shows views of the motion of the Ideal accelerating valve gear.

Electric Welding Machines.—Toledo Electric Welder Company, Knowlton and Langland streets, Cincinnati, Ohio. Bulletin No. 12. Illustrates and describes the various types of stock welding machines built by this company.

Heat Treating Furnaces.—Eclipse Fuel Engineering Company, Rockford, Ill. Pamphlet entitled "The Heat Treatment of Steel in Gas Furnaces." Discusses the various kinds of steel and their treatment for foreign annealing hadening and tempering

their treatment for forging, annealing, hardening and tempering.

Gang Drilling Machines.—Rockford Drilling Machine
Company, Rockford, Ill. Pamphlet. Illustrations and descriptive
matter explain how drilling operations can be simultaneously
performed in the vertical drilling machine that are ordinarily
handled by the horizontal method.

Are Light Hangers.—Thompson Electric Company, 337 Superior avenue, N. W., Cleveland, Ohio. Relates to the Thompson safety cut-out hangers for arc lamps in which the electrical connections are broken as soon as the lamp is lowered from the hanger.

Swing Check Valve.—National Tube Company, Pittsburgh, Pa. Circular. Deals with the Kewanee union swing check valve, which has an outside thread forming an immediate connection with the union.

Air Compressor.—Gardner Governor Company, Quincy, Ill. Circular No. AG3. Shows a 3 x 3½ in. vertical air-cooled compressor, which has a semi-inclosed crank case, grease lubrication, steel ball valves, drop forged crank shaft, etc. This machine was designed to meet the demand for a smaller machine than the company's regular line and its capacity is from 4 to 8 cu. ft. per minute.

Autogenous Welding.—Henderson-Willis Welding & Cutting Company, St. Louis, Mo. Pamphlet. Concerned with the various types of autogenous welding apparatus built by this company which include acetylene generators, torches, pressure regulators and indicators and accounter that the company was a company of the company which include acetylene generators, torches, pressure regulators and

Chucks.—Skinner Chuck Company, New Britain, Conn. Catalogue and price list. Relates to the various styles of independent universal and combination lathe and drilling and planing machine chucks, face plate jaws, drilling machine vises and reamer stands.

Fans.—B. F. Sturtevant Company, Hyde Park, Mass. Mailing card. Shows the Sturtevant Monogram fan which is designed for production of medium volumes at pressures not exceeding 5 oz. per square inch.

Wire Rope Fittings.—Hazard Mfg. Company, Wilkes-Barre, Pa. Pamphlet. Shows a line of hand forged wire rope fittings which includes open and closed sockets with or without swivel eyes and hooks, spindles and wire rope clamps.

Rolled Gears.—H. N. Anderson, 4944 Hamilton avenue, Cleveland, Ohio. Pamphlet. Deals with the Anderson process of gear rolling which was illustrated in *The Iron Age*, November 3, 1910.

Electric Mensuring Instruments.—Wagner Electric Mfg. Company, 6400 Plymouth avenue, St. Louis, Mo. Miniature bulletin No. 96. Describes the various types of electric measuring instruments made by this company.

Spring Dies.—National-Acme Mfg. Company, Cleveland, Ohio. Pamphlet. Concerned with the various types of Namco adjustable spring screw cutting dies. The special features claimed for these dies are the cutting of a better thread, ease of adjustment and better wearing qualities.

Forge Hammers.—Nazel Engineering Works, 404 North Fifth street, Philadelphia, Pa. Catalogue. Shows the line of Beché patent forge hammers for which this company has the sole manufacturing rights in the United States and Canada. These are built for general forging, large plate work, hollow ware and speed work, all of which are briefly described.

Tool Holders, Wrenches, Knurling Tools.—Alert Tool Company, 221-223 North Twenty-third street, Philadelphis, Pa. Catalogue No. 1. Size 6 x 7½ in. Describes and illustrates a line of universal and adjustable hand knurling tool holders, new type geared clutch tap wrenches, foolmakers' scrapers and small tool novelties.

Expansion Bolts.—Diamond Expansion Bolt Company, 90 West street, New York City. Catalogue No. 284. Size, 6 x 9 in.; pages, 48. Covers with many illustrations an extensive line of expansion bolts, including the Crown expansion bolt, the Diamond toggle and twin bolts and hollow metal fastenings, improved drills, Diamond boiler repair bolts, Diamond ground clamps, Trident guy clamps and varlous new appliances for telephone construction with price lists.

Bolts for Metal Construction.—Kling Bolt Company, 42 Broadway, New York City. Booklet. Size, 3½ x 6½ in. Deals with the Eureka Kling bolt, a form of bolt designed to allow the head to pass through the same diameter as the stem of the bolt, at the same time giving a firm anchorage on the opposite side. It is especially useful in attaching materials to pipes or other tubular shapes.

Steam Goods.—George B. Limbert & Co., Chicago, Ill. 1912 catalogue. Size, 5½ x 8 in.; pages, 282; cloth bound. This substantial book gives illustrated data concerning prices of the extensive line of steam goods which that company manufactures or handles, including standard and extra heavy cast-steel, semi-steel and cast-iron screwed and flanged fittings, pipe bends, power plant mains and general cut pipe work, also wrought-iron and steel pipe, malleable iron fittings, steam specialties, brass goods, and practically everything necessary for the equipment of the power plant.

Stone Tools.—Chicago Pneumatic Tool Company, Fisher Publisher Chicago, and 50 Church street, New York City. Catalogue

Stone Tools.—Chicago Pneumatic Tool Company, Fisher Building, Chicago, and 50 Church street, New York City. Catalogue No. 37. Size, 6 x 9 in.; pages, 23. Devoted to brief descriptions and illustrations of pneumatic tools for working stone, such as the Keller valveless tools, Boyer valved tools, surfacers, chisels and ripping and other tools, accessories and repair parts.

Engines and Blowers.—American Blower Company, Detroit, Mich. Four bulletins and four booklets. Bulletin No. 334, superseding No. 288, relates to A B C vertical self-oiling engines which are made with single and double cylinders for both high and low pressure work. Booklet No. 335 deals with the Detroit return, separating and vacuum steam traps, the first of which was illustrated in The Iron Age, November 16, 1911. Bulletin No. 337, superseding No. 234, pertains to the A B C line of twin variable-speed steam engines for driving paper making machines. Booklet No. 338, superseding No. 295, describes and illustrates briefly the Sirocco electric utility blowers which are intended to take their power from the nearest electric light socket. Booklet No. 340, superseding No. 284, illustrates the complete Sirocco line of fans and blowers which are built in a number of different sizes and styles for engine, steam turbine, belt and motor drive. The construction of these fans is described at length and a number of tables of dimensions are included. Bulletin No. 344, which is supplementary to Nos. 294 and 299, illustrates the A B C universal cast-iron blower and exhaust fan which is made in all the standard types of discharge.

Sheet Metal Machinery.—Canton Foundry & Machine Company, Canton, Ohio. Pamphlet. Treats of the Universal conductor pipe and eave trough machinery, paint rolls, drop presses, melting outfits and dies for cellings, sidings, cornices, etc.

Conveying Machinery.—Alvey-Ferguson Company, Cincinnati, Ohio. Catalogue No. 7. Illustrates and describes the A-F line of conveying machinery which includes gravity, power and belt conveyors; automatic elevators, coal and ash handling systems and conveyors of various types for handling packages and material of every description.

Internal Combustion Engines.—National Gas Engine Company, Cudahy, Wis. Catalogue No. 12. Describes and illustrates the Ingeco engines for gas, oil and producer gas. These are built in both horizontal and vertical types and after a brief description of the former, the various sizes including a portable one are shown. The different parts of the engine are described at length and the text is supplemented by numerous halftone engravings. Following a list of the special features of these engines small vertical engines are taken up and described in the same way as the horizontal ones.

Electric Hoists.—General Electric Company, Schenectady, N. Y. Bulletin No. 4939, superseding No. 4865. Pertains to the electric hoists made by this company in a number of different styles for various uses. The construction of these hoists is described at length with illustrations of the different styles among which is the inclined car haul hoist used at the Sewell's Point coal pier of the Virginian Railway Company, Norfolk, Va.

